

COMPUTERWORLD

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Data General's Eclipse S/250

DG Enlarges Eclipse Clan With More Powerful Minis

By Jeffry Beeler
CW Staff

WESTBORO, Mass. — Expanded processing power, main memory capacity and I/O capabilities were reportedly added to the Data General Corp. Eclipse series last week when the company enlarged the mini-computer line by two members — one for scientific applications and the other primarily for commercial uses.

DG's latest scientific mini, the S/250, is said to provide 20% to 50% greater performance and four times more addressable memory than the S/230, its nearest Eclipse relative. The commercial processor introduction — the C/350 — offers a similar performance and memory capacity edge over its closest Eclipse equivalent, the C/330, according to a DG spokesman.

Both the S/250 and C/350, which boost the number of Eclipse models to seven, also provide four to five times more I/O capability than the bottom-of-the-line S/130, the spokesman added.

DG likened the two 16-bit introductions in processing power to the Digital Equipment Corp. PDP-11/70, Hewlett-Packard Co. 3000 Series III and Prime Computer, Inc. models 400

and 500.

Some of the hardware features common to the S/250 and C/350 include a maximum memory capacity of 1M byte, a floating-point processor with a set of 56 single- and double-word instructions and a burst multiplexer

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IN DEPTH IN DEPTH IN DEPTH

Scared and angered by the torching of their neighborhood, residents of Boston's Fenway area not only spearheaded an investigation that brought the criminals to court, they also developed an arson prediction system. See this week's *In Depth*, beginning on Page 22.

Five Bills Link Boost In Funds for State DP To Matching Campaign

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — Five bills introduced recently in the U.S. House of Representatives would increase the flow of federal funds to state systems dedicated to welfare programs — but only if the states agree to match their welfare rolls against government and private employment and benefit records each year.

Authored by Rep. Ronald M. Mottl (D-Ohio), the bills are intended to bolster the use of computers in ferreting out fraud and abuse in federal welfare and loan programs. They are patterned after the matching programs conducted in recent months by the Department of Health, Education and Welfare's (HEW) Office of the Inspector General, a spokesman for the congressman said.

The first two bills would increase from 50% to 90% federal reimbursements of a state's expenditures for management information systems and fraud control units under the Aid to Families With Dependent Children (AFDC) program as long as the state matched its lists of welfare recipients against employment records. This matching effort would extend beyond a perusal of federal, state and local government employment records to the wage reports of private employers and to the benefit records from such national programs as Social Security, Supplemental Security Income, railroad retirement and veterans payments.

The remaining three bills would permit the HEW Secretary to obtain death records to prevent unauthorized payments.

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Spin Conference Gets Under Way

• Informatics, Power Tied

By E. Drake Lundell Jr.

CW Staff

TORREMOLINOS, Spain — Any nation that wishes to be a sovereign nation must achieve independence in informatics — which means computer power geared "to its own needs and aspirations."

The alternative can lead a nation to "servitude," Amadou-Mahtar M'Bow, director general of the United Nations Educational, Scientific and Cultural Organization (Unesco), told delegates in his opening address here at the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) last week.

Informatics, M'Bow said, is more than just a form of power: it is a whole power system in itself. Computer technology is important not only for itself, but also because it allows countries and people to make use of other techniques.

Because the use of informatics opens up — or the lack of informatics can block — new areas of information retrieval and processing, it is critical for development, he indicated.

Independence in informatics is "a crucial factor in the establishment of a just international order" and "is a challenge to the international community, whose ability to overcome its selfishness . . . is seen now as never before to be decisive."

"We see looming on the now not-too-distant horizon the possibility of a redistribution of world power zones on the

(Continued on Page 4)

• Multinationals Attacked

By E. Drake Lundell Jr.

CW Staff

TORREMOLINOS, Spain — Major criticism about poor service and an undue emphasis on quick profits was leveled at multinational corporations in general and IBM in particular by several Arab, African and other Third World countries at the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) here last week.

Although speakers never mentioned IBM by name during their formal presentations, they confirmed later in private conversation that the charges made against multinationals were aimed specifically at IBM policies around the world.

Indonesian delegate Sondang P. Siagian, for example, charged the multinational manufacturers with not working as "partners in development" with the Third World countries, contending they are instead interested only in the greatest possible profit in the shortest amount of time.

The manufacturers' after-sale service is often "less than satisfactory," he said, and Third World countries often receive less service than the developed nations. Indonesia, which has restricted the IBM operation in its country, was joined in its criticism by Nigeria, from which IBM has withdrawn officially, and by Iraq, whose delegates said IBM had stopped marketing there more than a year ago without ever announcing its pullout.

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DPMA Tells Congress: Crime Law, Licensing Don't Mix

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — Nothing in the computer crime legislation being considered in the U.S. Senate should encourage the licensing at the federal or state level of computer professionals, the Data Processing Management Association (DPMA) recently told a congressional subcommittee here.

"We believe professional societies such as our own are the proper vehicle for developing the necessary technical and ethical skills to deal with computers and their management in a potentially criminal environment," DPMA Executive Director Edward J. Palmer wrote to the Senate Subcommittee on Criminal Laws and Procedures.

The DPMA urged the subcommittee to make it clear that passage of S. 1766 which would classify computer-related crimes as felonies punishable by fines and jail terms, to require that computer programmers and analysts be licensed or certified. The concern that the proposed law might lead to licensing was first raised by Subcommittee Chairman, Sen. Joseph R. Biden Jr. (D-Del.) during hearings earlier this summer [CW, June 26].

While it strongly endorses the legislation proposed by Sen. Abraham Ribicoff (D-Conn.), the DPMA noted "Certification and licensing in any professional field is always difficult. No matter what the body of knowledge, it is constantly in a state of flux.

"However, in the approximately 30 brief years the computer has been used in the solution of business problems, the technological growth and development has been phenomenal," Palmer said. "It would be naive to believe a computer professional holding a cer-

tificate or license issued two or three years ago is still current in his professional knowledge simply because he holds that credential."

Too Much Paperwork

The association that established the Certificate in Data Processing (CDP) added that the administrative task of preparing tests to periodically measure the current knowledge of hundreds of thousands of computer professionals would be overwhelming.

In addition, the DPMA supported the suggestion made during the hearings on the bill that its terms become effective no earlier than one to two years after they are signed into law by the President. There must be full dissemination of the law's requirements to the computer professionals who will be affected by it, the association stated, promising to do its part in this communications task.

Palmer said the association is "pleased to see Congress address itself to the admittedly complex area of computer-related crime," but noted that because of the field's technological complexity, there is a greater need for clarity of congressional intent.

Computers are a new dimension to existing types of crime, the DPMA reasoned, so computer-related crime should be addressed in its own statute.

The association suggested, however, that the final format of S. 1766 be compatible with S. 1437, the Criminal Code Reform Act recently passed by the Senate, while maintaining its autonomy in the current criminal code. If the reform act successfully passes the U.S. House of Representatives, the computer crime legislation could then be easily transferred to the new code, the DPMA said.

In addition, by casting S. 1766 in the

form of the proposed code, the subcommittee could differentiate in the law between the individual who casually uses a computer for his own pleasure or enlightenment and the one who uses it criminally for monetary gain, the association stated.

Data vs. Information

The DPMA also recommended the legislative history of the computer crime bill be expanded to cover those instances when information is stolen from a computer without being removed; when information is damaged or even destroyed without any physical action taken against its backup data; and when the absence of data in a computer system might be information important to the criminal.

Key to these potential crimes is the distinction between data and information. "Information is a processed form of data and is consequently of more value," according to the association.

Finally, the DPMA told the subcommittee it "reluctantly" supports the broad federal jurisdiction over computer crime encompassed in S. 1766. The talent and sophistication required to detect and prosecute computer-related crimes are not widely available today and attention to their development probably should be concentrated at the federal level, Palmer wrote.

The association is also fearful of conflicting and contradictory legislation being enacted by the states: "Much of today's computing capability is directly dependent on sophisticated communications capabilities and very often will involve the interstate 'transportation' of information. In this framework, we feel the federal government is the appropriate locus of authority to deal with criminal abuses of this information handling."

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More Than 75 Nations on Hand Meet Highlights Informatics' Clout

By E. Drake Lundell Jr.

CW Staff

TORREMOLINOS, Spain — More than 75 countries ranging from the major powers such as the U.S., UK, France and the USSR to smaller nations such as Chad and the Vatican were on hand for the opening of the 10-day Intergovernmental Conference on Strategies and Policies in Informatics (Spin) here last week, indicating the importance the world community places on the issues of computing.

And while verbal pyrotechnics were expected over the domination of the computer industry by Western nations, other proposals were also on the agenda.

One of the major problem areas for computerization in the developing nations is financing, according to Ibrahim Saad El-Miligi, the delegate from Sudan. Countries that are just getting into the computer age, he said, need financial assistance and support to do so — which they need, in turn, to become more developed nations.

Financing, he added, "is the fundamental prerequisite" before the developing nations can even begin to discuss the problems of training staff and developing meaningful applications.

New Economic Order'

Kamel Abdallah Khoda, the minister of planning for Algeria, said many areas of informatics need to be implemented on a large scale to help develop a "new economic order." While he hit hard at the "monopoly and hegemony" of the developed nations over the computer industry, pointing out that this monopoly can lead to a widening gap between the rich and poor countries, Khoda spent more time discussing other problems faced by the developing nations.

One of the largest problems, he said, is the high price of training computer staff and the need to mobilize national resources in support of this effort.

Countries must spend more effort planning their informatics efforts, Khoda said, adding there is a need for more cooperation between the developing countries in order to better pro-

CW At Spin

TECT their common interests.

Government Control

At the same time, the developing countries should work unceasingly together to get better control over the exchange of equipment with the developed nations, according to Khoda. To do this, Algeria is moving toward gradual control over all aspects of internal informatics in order to make the nation less dependent on outside forces.

Applications in the areas of health and education would be a good place for cooperation between the developing nations, he said, without following the models for such systems in the more developed countries.

Technology transfer between the developed nations and the developing nations needs to be speeded up, he said, adding that there has been much talk in this area, but little real work. Along with this he pointed to a need for more standardization in the areas of hardware and software so there will be true compatibility between the systems of the Third World.

Concrete Action Needed

The Spin conference should develop a definite action program to implement the outcome of the conference and to set up concrete programs for action, Khoda said. The Tunisian delegate, Slaheddine Karoui, indicated informatics had been injected into many developing countries in a "wild" way, often causing social upheaval.

For this reason, the developing nations need to research the implications that computers have for their societies so they can plan for the changes. The developing nations should also undertake research in such applications areas as health and education, he said, adding the software developed by these nations could then be shared by all developing nations.

Nasis Makes Modest Offer

TORREMOLINOS, Spain — The U.S. National Association for State Information Systems (Nasis) offered to open its software transfer program to developing nations during the opening days of the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) here last week.

Albeit a modest proposal, it was the only one to surface by press time despite indications the French, British, Americans and Soviets had specific offers for the meeting.

Under the Nasis program, U.S. states adapt software developed in other states for a nominal cost. According to the offer made here, developing nations could use state-developed programs and receive aid in transferring them to their local environments. The costs would be borne by the nation involved.

Other proposals expected to surface this week will probably call for some controls over multinationals and greater independence for local computing, regulations and trans-border data flow and possibly greater aid for the developing countries entering the computer.

M'Bow Links Informatics to Sovereignty

(Continued from Page 1)

basis of the monopolization of the nerve centers" of the worldwide information network, M'Bow, a Senegalese, declared.

"Over and above the present inequalities in the distribution of resources and means between the north and south of our planet, which we are now trying to mitigate, we see an inequality within the industrialized world itself between one or two states and even one transnational corporation and the other states which would be reduced to the status of intermediaries or peripheral agents," he con-

nued.

A structure with the power concentrated in the hands of a few countries or even in the hands of one corporation "could render many of the attributes" of a nation's "genuine independence or of individual and group initiative null and void," he said. The single corporation to which M'Bow referred in his remarks here was IBM, conference observers agreed.

However, M'Bow contended this does not need to happen. With the proliferation of small systems there is also an opportunity to "multiply almost limitlessly" computer systems

and to decentralize information networks.

"A technique of an elitist nature will give way to an activity that will benefit people at large," he said.

Breaking Down Barriers

In the past, M'Bow noted, progress has often benefited the few rather than the many — "certain peoples rather than the human race as a whole." Today, however, every person's destiny tends to be linked to the destiny of others and to the destiny of mankind as a whole.

While in the past this integration has developed along horizontal lines from the top down, he said that today there is the opportunity to use computer power to distribute information horizontally and thus break down the barriers between people.

"Is tomorrow's world then likely to be more alienating or more liberating than today's? Is the revolution in informatics going to make all think, feel and live according to the pattern of the few?" he asked.

Or will the revolution in informatics "make possible an infinite number of horizontal, decentralized contacts between different men and different cultures, a continuous process of mutual enrichment?"

Source of Answer

The answer to these questions must come for those areas where "information is most meager and the risk of alienation the greatest, that is, from the least technically advanced countries.

"Will these countries still seeking the paths of development which set people free be enslaved by this formidable instrument of progress from a different world — or will they seize upon it as a powerful lever whose creative use can provide a historic short cut to the future?" he asked the delegates.

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Swedish Privacy Advocate Says:

Privacy Loss Not Informatics' Most Vital Effect

By E. Drake Lundell Jr.

CW Staff

TORREMOLINOS, Spain — The loss of privacy is "not the only or perhaps even most important part" of the overall social impact of computerization, according to one of the first voices raised in the fight for control over computer systems at an international conference here last week.

Kerstin Aner, the Swedish Secretary of State, made that suggestion in a paper presented at the opening session of the Intergovernmental Conference on Strategies and Policies in Informatics (Spin). Aner, one of the principal forces in developing the Swedish privacy law on computer systems when she served, as a member of the Swedish parliament, said other social effects of computers may be more serious than the privacy question.

These other issues include the use of computers in the work place, the over-reliance on computers by governments and the vulnerability of the computer-based society to attack.

Primary Rule

On the privacy issue, Aner told the delegates their foremost rule should be "don't let Big Brother pry."

"And then you should add: Make sure the people who, for some reason, have to be watched and controlled by the state are able to watch and control the state in their turn, which can sometimes be done very cleverly with computers."

The second slogan should be "don't let Big Brother ruin you," Aner said, explaining, "Government computers, like all others, always perform less than their salesman promised. They will cost more to install and run than you thought when you bought them."

A national computer policy must take a firm grip on what a computer system should perform and what it should cost, she added.

Furthermore, she added, computers are just passing out of their "steam age"; distributed processing and data bases will have some important political implications for both the developing and developed nations.

No Bullying

A third slogan, according to Aner, is that one should not let "Big Brother bully you. This goes especially for workers in factories and offices, who are often made very unhappy by computerization because it is done in an insensitive way."

Too often computers are developed and implemented without regard for the people who they serve, she said.

For example, Aner noted, "one often neglected effect of computers in indus-

try is that they always produce an unintended fallout in the form of new means of control. A worker whose pace and rhythm of work is coupled to that of a computer always leaves quantified traces via that computer for anybody who wishes to study how fast and when he has worked."

Ergonomic Effects

Another aspect of computers at work is ergonomics — or the biotechnological dangers, such as eye strain and radiation risks from terminals, she said.

On the vulnerability of the computer society, Aner warned that while data banks, data nets and data links make for efficiency, they also make for "ex-

tremely" vulnerable communication and flows of information.

The cashless and checkless society "will be completely at the mercy of its

it does to the people being administered."

Any community in which a big volume of very exact data is needed very often to run it will necessarily ask of its citizens much higher accuracy than they will probably be able to produce. In such systems, she said, a certain balance must be struck between the improvements that the computer can bring and the inconveniences they will cause to the individual citizen.

"Certainly computer education can and should be the answer, or one of the answers," Aner said. "In the developed world, to be computer-illiterate will soon be just as much of a handicap as being an ordinary illiterate."

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programmers and its low computer technicians, not to mention its computer-minded thieves," she said.

Aner's final slogan was "let Big Brother serve the people. This means," she explained, "before you computerize any large administration, see what

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User Sues Mini Vendor on CAD/CAM System

By Brad Schultz
CW Staff

MINNEAPOLIS — Jostens, Inc., a manufacturer of school class rings and sports championship rings, has filed a \$2.9 million suit here against National Computer Systems, Inc. (NCS) that charges the vendor of special-purpose minicomputer systems with theft of trade secrets, illegitimate disclosure and use of those secrets and breach of implied contracts.

Also named as defendants are a firm acquired by NCS — Data Input, Inc. — and three former Jostens employees who now work for NCS: John S. Titus Jr., an NCS vice-president, Robert J. Henderson and Allan Willard Hoagberg.

As Jostens employees, Titus, Henderson and Hoagberg were involved in the development of the firm's numerically controlled computer-aided design (CAD) and computer-aided manufacturing (CAM) system, which is used in the production of molds, tools and dies as a part of the firm's ring manufacturing process.

After these individuals joined NCS, they used Jostens' trade secrets to help develop and market a CAD/CAM system, called Computool for NCS, the complaint charged, noting the NCS system was delivered to one of the plaintiff's competitors, L.G. Balfour Co. of Attleboro, Mass. this spring.

Software programs and specialized hardware, tooling, machinery and production processes comprise the "secret elements" applied to the design and production of rings, the complaint explained. "Josten's undertook very deliberate steps well known to the individual defendants to ensure that the secret aspects of the process not be disclosed," it added.

These steps included requiring employees involved with the Jostens' CAD/CAM system to sign nondisclosure agreements, the document continued, noting that Titus and Henderson and possibly Hoagberg signed such agreements. The three were therefore

accused of breaching both "their confidential relationship" with Jostens and "implied and explicit contracts."

"Certain aspects of Jostens' tooling and machinery interfacing with its own CAD/CAM program have never been known" by Balfour, according to the brief, but Josten's "believes that Balfour is employing and seeking to employ almost identical tooling, machinery and interfacing which could only have been developed in a short period of time with the defendants' assistance."

Jostens said its CAD/CAM system "reduced significantly" its "manufacturing lead time by eliminating many of the interim steps normally required in the production of rings."

"The importance of the special software interfacing between [the system's] component parts and the need for a special cutting tool is illustrated by the fact that between 1974 and 1978, no other class ring manufacturer had a CAD/CAM system," Jostens stated. Further, "no such competitor had in place the total manufacturing and production techniques necessary to fully utilize and implement

such a system."

Jostens claimed Titus left his job as manufacturing engineer with the firm in November 1975 to join NCS in the development of CAD/CAM technology applied to "other unrelated industries but without any authorization to disclose or use Jostens' trade secrets."

"In early 1976, Data Input approached Jostens with a proposal to further enhance Jostens' CAD/CAM system if Jostens would make its [CAD/CAM-related] software program generally available to Data Input," the complaint continued. This proposal allegedly stipulated that Jostens' would agree not to disclose software updated by Data Input, that Data Input would be sole owner of such programs and that Data Input would agree not to sell CAD/CAM technology to any competitor of Jostens'.

Jostens declined Data Input's offer. Then, this June, Jostens learned of the Balfour installation; on the belief that NCS could not have delivered its system without having used Jostens' trade secrets, it launched an investigation that culminated in the legal action.

The action filed at the Hennepin

County, Minn., District Court seeks an award of \$2 million from NCS and \$100,000 from each of the individual defendants as punitive and exemplary damages.

The action further seeks \$600,000 from the defendants to reimburse Jostens' for the cost it expended in developing its CAD/CAM system and an amount "yet to be determined" to reimburse the jewelry firm for its other costs related to CAD/CAM.

The action also seeks contract rights or an amount equal to "any direct or indirect profits and revenues" gained by the defendants through alleged use of Jostens' trade secrets.

Finally, Jostens is seeking an award of damages resulting from its "future lost profits" as well as a judgment for attorney's fees.

Jack Fenton, NCS finance vice-president, denied Computool was developed with the benefit of Jostens' trade secrets and called Computool "obviously" much more advance in design than the Jostens' product.

NCS will be represented by the Minneapolis law firm of Leonard, Street and Deinard.

Two Introductions Enlarge Eclipse Clan

(Continued from Page 1)
channel that transfers up to 10M byte/sec, the spokesman said.

Both Eclipse series additions accommodate MOS or core main memory with two- or four-way interleaving. With core, the processors hold up to 512K bytes and have a memory cycle of 800 nsec.

With MOS, the machines accommodate as much as 1M byte, read in 500 nsec and write in 700 nsec, DG said.

The S/250 requires a minimum of 64K bytes of main storage expandable in 64K-, 128K- and 256K-byte increments, according to the spokesman. The C/350, which uses the same basic instruction set as the C/330, requires at least 128K bytes and expands in the

same three increments. In the Eclipse family, only the two latest additions provide 128K- and 256K-byte memory modules, reportedly the densest packaging yet available with a DG processor.

Floating-Point Functions

The floating-point processor, which comes as standard equipment with the commercial mini and as an option with the scientific model, reportedly offers four 64-bit hardware accumulators. In addition to its basic instructions, it provides a set of extended floating-point functions for sine, cosine, square root, natural logarithm, exponential operations and polynomial evaluation, the spokesman said.

In 64-bit double-word operations, the floating-point processor typically executes an ADD command in .6 microsec, MULTIPLY in 2.2 microsec, SINE in 28.6 microsec and natural LOGARITHM in 24.3 microsec, he added.

To match these execution speeds, both the S/250 and C/350 also provide an optional burst multiplexer channel that inputs data at up to 10M byte/sec and outputs at up to 6.7M byte/sec. With the burst multiplexer channel, the two processors reportedly support DG's 1M or 2M byte/drive, Winchester-type disk systems as well as the company's 50M-, 96M- and 190M-byte disk units.

The channel also accommodates DG's 10M- and 20M-byte disk systems, 315K-byte diskette units, 75 in./sec tape subsystems and 180 char./sec Dasher LP2 printer as well as all members of the Dasher CRT and printer terminal family.

Hardware features available only with the S/250 include two types of control storage — writable control storage (WCS) and fixed control storage (FCS) — plus an integral array processor driven by a 132-bit word implemented in 200 nsec firmware.

The WCS stores 1K 56-bit words, while the FCS incorporates a 2K

(56-bit) word programmable read-only memory (Prom), the spokesman said. Both types of control storage provide a 16-function arithmetic/logic unit and 256 16-bit scratchpad registers with 50 nsec access.

The array processor, meanwhile, is said to incorporate a 512- by 64-bit Prom that executes a Fast Fourier Transform in 8.75 msec and a 1K-point array multiplication in 650 microsec. With a 64-bit bus that transfers 40M byte/sec, the unit provides 46 array, matrix, transform and signal processing instructions.

Both the S/250 and C/350 operate with DG's Advanced Operating System (AOS) and Real-Time Disk Operating System (RDOS). Together, the two operating systems typically allow the C/350 to support four to 24 terminals for distributed processing applications in medium to large organizations, particularly Fortune 1,000 firms, DG said.

The operating systems also permit the C/350 as well as the S/250 to accommodate Algol, PL/1, Extended Basic, Business Basic, Fortran IV, Fortran V and DG/L, the vendor's system development language.

An S/250 with a 128K-byte MOS memory and single-bay cabinet costs \$34,500. A 512K-byte S/250 with a floating-point processor, burst multiplexer channel, 2M-byte fixed-head disk unit, 190M-byte disk subsystem, two tape subsystems, 600 line/min printer, eight-line asynchronous multiplexer, six CRT terminals, 30 char./sec printer terminal, three-bay cabinet and software support sells for \$193,000.

A 512K-byte C/350 with the burst multiplexer channel, two 96M-byte disk subsystems, tape unit, 2M-byte fixed-head disk subsystems, console, 600 line/min printer, 12 CRT terminals and synchronous communications controller costs \$228,000.

Both the S/250 and the C/350 are available immediately from the firm at Rt. 9, Westboro, Mass. 01581.

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For Fraud, Breach of Contract Billing Service Firm Brings \$3.5 Million HP Suit

By Brad Schultz
CW Staff

NEWPORT NEWS, Va. — A "medically oriented billing service company" here has filed a \$3.5 million damage suit against Hewlett-Packard Co., charging the vendor with "fraud or innocent misrepresentation," breach of contract and "negligence and malpractice."

The formal complaint filed by Investment Counseling Services, Inc. (ICS) in the Federal District Court of Eastern Virginia stated that HP "knew or should have known of certain material deficiencies and inadequacies in the equipment and software" it delivered to ICS in accordance with oral and written contracts.

The plaintiff asserted that HP caused ICS to unknowingly buy goods ill-suited to its needs by failing to disclose these flaws and by misrepresenting the products' performance capabilities.

ICS argued that HP committed fraud/misrepresentation (count I) by misleading the customer; breach of contract (count II) by not delivering what was promised; and negligence/malpractice (count III) because the vendor "failed to provide certain services and advice to plaintiff which equaled or exceeded then-prevailing standards . . . with the data processing industry."

1975 Beginning

The suit arose from the outcome of ICS's decision in late 1975 to upgrade its DP facilities. In January 1976, the firm issued a request for proposals (RFP) to computer vendors. Within five months, ICS evaluated the responses of a number of vendors, including HP. It eventually decided to reject HP's response and contract with another respondent.

"However, an HP agent [Ed Oakley] met with ICS agents in Newport News, Va., and presented a handwritten proposal for and on behalf of HP which replaced the prior proposal," ICS stated.

The new HP proposal offered different hardware, software and software services with additional capabilities, ICS maintained.

Promises Unkept

The complaint also said Oakley verbally assured ICS that this new proposal was fully responsive to the firm's stated needs; that the new hardware proposed was "fully tested and reliable," that ICS could easily convert its existing software, implemented on Honeywell Information Systems, Inc. hardware, to the new equipment; and that "HP would furnish to ICS everything that was needed for an efficient, reliable, on-line system . . ."

HP did not fulfill these promises, according to ICS.

The plaintiff also claimed HP's MPE time-sharing system software has proved "totally inefficient and improper for use with an on-line system of the type requested. Its attempted operation would necessarily involve redundancy of processing" resulting in an inadequate terminal query response time for the billing service's customers.

Further, ICS called the vendor's data entry library (DEL) "extremely inefficient," explaining that the library fur-

ther reduced response time, yet was proposed by HP "in order to necessitate ICS's purchase of HP-manufactured computer terminals in the future . . . since DEL is only compatible with HP-manufactured and sold terminals."

The plaintiff said HP's Image software, which is intended to instruct the CPU on the accessibility of stored data for subsequent retrieval, "did not allow for 'multiple key access,' thus restricting the usage by multiple [ICS] customers of terminals and the access by them to the proposed [on-line] computer system."

ICS also stated that HP provided disk drives manufactured by Information

Storage Systems, Inc. (ISS) but "relabelled" by HP. "At the time HP proposed these disk drives . . . it knew or should have known that they were inefficient, prone to failure and operated too slowly."

"On information and belief, HP was then planning to discontinue its relabeling and sale of ISS-manufactured disk drives and replace same with more reliable, efficient HP-manufactured disk drives," the plaintiff continued.

Shut Down System

ICS said it first tried out the new system in January 1977 and encountered "multiple and continuing failures of

the terminals . . . shutting down the entire system" as soon as an actual workload was imposed.

These failures persisted and worsened despite HP's repeated maintenance efforts, the billing service added.

ICS has claimed \$328,200 in damages on count I of the complaint; \$2,908,200 on count II; and about \$421,600 on count III, for a total of just less than \$3,450,000 "plus interest and costs."

ICS is represented by the Boston law firm of Thomas K. Christo. At press time an HP spokesman said the vendor has only just been served with the suit and is not yet ready to comment on the matter.

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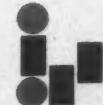
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Bills Tie Hike in State Funds to File Matching

(Continued from Page 1)

ments under the Social Security Act; allow disclosure of federal tax return and Social Security information to HEW for use in collecting unpaid student loans; and authorize the funds needed by the HEW Inspector General's Office to conduct these anti-fraud programs.

In a statement on the House floor last month, Mottl predicted his legislative package will save \$1.2 billion of the \$6.4 billion to \$7.4 billion HEW estimates it loses as a result of fraud, mismanagement and abuse each year. Sources close to HEW expect next year's report from the HEW Inspector General to put the losses between \$8 billion and \$10 billion annually.

No Privacy Violations

A cursory examination of the five bills by the Library of Congress' Congressional Research Service indicated they will not violate the Privacy Act of 1974, Mottl's staff member said.

Both Mottl and HEW Inspector General Thomas D. Morris expressed awareness of the privacy implications in the computerized matching of records containing personal information. Speaking at a conference on computer fraud, security and privacy sponsored by the Association of Government Accountants here two weeks ago, Morris called the Office of Management and Budget's (OMB) guidelines on matching projects "reasonable and just" [CW, Aug. 21].

In connection with Project Match — Morris' office's effort to match 4.8 million military and civilian federal employees against 78% of the nation's welfare rolls — the Inspector General said HEW regulations insist on promptly purging from the files the names of individuals suspected of "double dipping" once they have been shown to be receiving legitimate welfare payments.

Ultimately, Morris expects a return of \$12 million for an investigative investment of about \$1 million. About

2% of all the federal employees investigated will find their cases prosecuted as a result of Project Match, he stated.

Mottl decided to legislate computerized matching to prevent fraud after reading Morris' 1977 annual report detailing the results of Project Match and his other antifraud campaigns. The congressman said he offered his bills to counter an across-the-board funding cut for HEW's social welfare programs voted by the House in June.

All of the bills have seven sponsors and two of them are also supported by Rep. Norman E. D'Amours (D-N.H.). The other congressmen who responded to Mottl's plea for support are Representatives John Fary (D-Ill.), Don Marriott (R-Utah), Robert Lagoni (R-Calif.), William G. Whitehurst (R-Va.), Austin Murphy (D-Pa.), Les AuCoin (D-Ore.) and Henry Hyde (R-Ill.).

In addition to matching the state funds devoted to management information systems for welfare programs, the first bill, H.R. 13840, would provide federal reimbursement of 90% of state expenditures to establish and operate "fraud control units" — offices to prosecute persons for criminal violations of welfare and loan programs.

Bill No. 2 — H.R. 13841 — would authorize the HEW Inspector General to match all federal civilian and military payrolls against individual state master lists of welfare, general assistance and food stamp recipients. This computerized matching would supplement the information gained by the states in their efforts to locate program abusers.

The HEW Inspector General would also be given the authority to act for the HEW Secretary in obtaining death records from states and localities to prevent illegal Social Security payments from being made in the name of the deceased. Sanctioned by Mottl's third bill — H.R. 13842 — this power would become a "routine use" of personal records under the Privacy Act of 1974, the congressman said.

The fourth bill, H.R. 13843, would enable HEW's Commissioner of Education and officials of participating educational institutions to verify a candidate's eligibility for a student loan and to collect on defaulted loans. This would amend the Internal Revenue Code of 1954 and the Social Security Act to allow the disclosure of the mailing address of the individual who has failed to pay back his loan to HEW.

HEW would also be allowed to disclose mailing addresses to universities and private lending institutions.

"Four of my five bills effect tighter front-end controls over eligibility and claims payment procedures as well as demand higher standards of integrity on the part of all concerned," Mottl said in introducing his legislation.

The last bill, H.R. 13844, would add to the resources of the HEW Inspector General's Office to permit an activist antifraud campaign. Morris told the conference attendees he hopes to double his staff of 100 people "shortly."

H.R. 13844 itself calls for funding to permit Morris and his staff to study drug purchases, respiratory therapy and student financial aid programs for investigations and to address "any pending proposals" for similar matching efforts.

Mottl hopes to find support for his efforts in the Senate and is looking, in particular, toward the office of Sen. Sam Nunn (D-Ga.).

In the meantime, his bills have been referred to the House Government Operations Committee, the House Ways and Means Committee and the Interstate and Foreign Commerce Committee for further action.

Third World Nations Hit Multinationals

(Continued from Page 1)

The chief of the Nigerian delegation, G.O. Awomolo, particularly criticized the training provided by the manufacturers of computer equipment. All of this training, he said, is geared only to each manufacturer's own equipment and is designed only to train staff to operate the machines in the most basic way — leading to the need for constant upgrading to do the necessary work.

Anything above this most basic training "costs a fortune" to get from the manufacturer, he argued.

While he said Nigeria welcomes companies that will live within its laws, Awomolo contended that overdepen-

dence on any one manufacturer leads to a situation in which that manufacturer tries to "hold the government for ransom." Furthermore, he charged the multinationals refuse to negotiate on their standard contracts, so the countries are stuck with contracts that favor the vendors.

Because of this, Awomolo said he hoped the Spin meeting would develop a standard contract in favor of the developing nations that all could use when negotiating with the multinationals. Information on informatics should be made available through international organizations, he said, and not just be in the hands of the multina-

tions.

The harshest criticism came from the Iraqi delegation, which was privately bitter about IBM's marketing practices in that country. The monopoly that exists in the computer field has "disastrous" effects on the developing countries, according to the chief of the delegation, Hilal Aboud Albayati. This monopoly makes it impossible for countries to make the best possible use of their computers, he said, and that hold on the market should be broken.

In order to do this, Albayati said, the Arab countries are considering a unified purchasing policy calling for a standard contract that all would use when dealing with the multinationals. Furthermore, he noted, the Arab countries are considering developing their own communications satellite systems so they will not have to rely on other communication firms.

The data banks available in the West are "incompetent" for use in the Third World because the information they provide is based on the needs of industrialized countries, Albayati believes. This type of data is virtually useless for nations whose economies are largely agricultural.

As a result, there is a need for data banks developed specifically for Third World countries, he indicated.

As another part of the unified Arab efforts vis-a-vis the multinationals, Albayati called for a unified policy with regard to price to assure all the countries receive the same price quotes on equipment. And, he added, the multinationals "should not be able to increase prices unilaterally."

The multinationals should also be encouraged to set up parts and maintenance depots in the developing countries, he said, so those countries would not be so subject to imports of equipment. The concept of a united position with regard to multinational computer firms is a "concept we are going to fight for," he warned.

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Businesses Seek Substitutes for Postal Service

By Marguerite Zientara

CW Staff

WILLOW GROVE, Pa. — A majority of businesses that depend on first class mail service for at least part of their communications needs today are seeking alternatives — such as electronic mail — as a means of overcoming the growing problems associated with the U.S. Postal Service.

This was the finding of a recent survey of 255 members of the Administrative Management Society (AMS).

Seventy percent of the survey respondents see the postal system being replaced by other forms of communications in the future, the survey showed. Seventy-five percent see an eventual degrading of the Postal Service and 94% predicted constant spiral-

ing of postage costs.

When respondents were asked if they planned electronic transfer applications in their companies, 52% said yes and 47% said no. Forty-two percent predicted this application would be used for payroll; 26% said it would be used for accounts payable; and 27% said it would be used for accounts receivable. About 40% of the respondents did not answer the question.

When asked about other systems of communication such as facsimile, Telex and courier service, 34% said they would make use of facsimile equipment, 32% said they would use Telex and 30% said they would use courier service.

In spite of these indications, 67% of the participants in the survey indicated

that first class mail does meet their service requirements and 33% said it does not. When asked, however, if a future expedited first class mail service with two-day delivery nationwide would be used even if it added postage costs, 57% said yes and 43% said no.

Sixty-eight percent of the respondents reported that the recent postal rate increase did not influence their use of first class mail. When asked if they would urge their companies to switch to telephone service, 78% said no, 18% said yes and 4% did not answer.

The survey was taken of AMS' Committee of 500, a survey panel comprised of members throughout the U.S. and Canada representing a cross-section of the business community. Of the 500, 245 did not respond.

CIG Stock Soars 600% — But No One Knows Why

By Brad Schultz

CW Staff

NEW YORK — The traded shares of Computer Investment Group (CIG), a major lessor of computer systems, have soared in value over the past dozen days, leaving shareholders at press time with portfolios nearly 600% more valuable than on Aug. 21.

A poll of computer stock market analysts found no explanation for the CIG phenomenon.

The price per share of CIG on the American Stock Exchange (Amex) when it opened on Monday, Aug. 21, was about 94 cents. At the day's closing, this value was \$1, up just 6 cents after 3,000 shares were sold.

But by the end of Aug. 22, the value of CIG stock was \$2.50 after the sale of 49,900 shares. During that day, a new yearly high for the price had been set at \$3.25.

By the close of Aug. 23, CIG's price per share was a flat \$5 after a volume of 148,900 shares sold — which made CIG the third most actively traded stock on Amex that day. Another annual record was attained at about \$5.88.

And by the close of the next day, the price per share was \$6, following 295,000 shares traded. CIG was Amex's second most actively traded stock for the day and what may prove to be the highest value of CIG stock for some time was set during the day at about \$7.88.

At the week's close — the end of Aug. 25 — the price was \$6.75 after 113,000 sales, a decrease of activity that dropped CIG to the rank of eighth on the exchange. But CIG shares were then worth 720% more than at the end of the previous week.

On the next day of trading, CIG suffered its first decline since the romp in prices began. After 59,300 sales, the Aug. 28 closing price per share was \$6.25.

At press time, the price of one share of CIG was about \$5.63.

CIG's executive vice-president, Sy Israel, said he had no idea why this abrupt rise occurred. The shares of other computer leasing firms traded on major stock exchanges have not experienced any dramatic movements in prices.

On Amex, the values of Pioneer Tex Corp. and DCL — two other computer lessors — were \$6.12 and \$4 per share, respectively, at the start of Aug. 21 as well as the close of Aug. 29.

On the New York Stock Exchange, computer lessors DPF Inc., Itel Corp. and U.S. Leasing were about \$13.38, \$32.50 and \$19.75 per share, respectively, at the Aug. 21 start and \$12.12, \$31.50 and \$18.38 per share at the

Aug. 29 close. None of these five CIG competitors experienced any increase during the time CIG soared.

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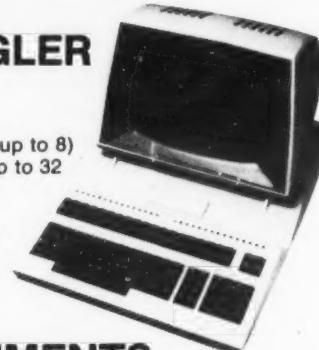
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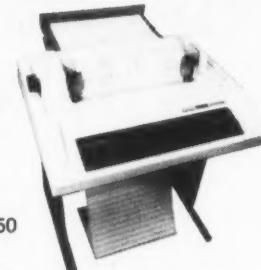
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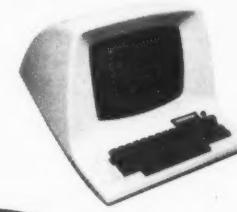
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Report Charging Federal DP Policy Vacuum . . .

By Brad Schultz

CW Staff

WASHINGTON, D.C. — "Fragmented responsibility" has provoked a DP "policy vacuum" in the federal government.

This was one of the charges made in a report by the House of Representatives Appropriations Committee for inclusion with the Department of Defense (DOD) Appropriations Bill of 1979, now under consideration in the Senate.

Among the other charges are that the Office of Management and Budget (OMB) and the General Services Administration (GSA) have failed to provide policy direction for the government's procurement of DP goods and services under provisions of the Brooks Act.

OMB should "be clearly designated as the single [DP] policy organization in the federal government," and the standard interpretation of the Brooks Act set forth in government regulations — Federal Management Circular (FMC) 74-5 — should be revised, the Appropriations Committee said.

Moreover, the notions forming the basis of the Brooks Act, the 1965 law that outlines the acquisition methods for DP goods and services, have been outmoded by computer technology advances, the committee contended.

Competition Overemphasized

Federal agencies overemphasize the importance of competition for government contracts, the report said, explaining "fiscal loss and a degradation of performance" may result from an acquisition based on purchase prices alone.

The "laudable objectives" of the Brooks Act cannot be reached unless government buyers consider "all valid cost factors" — not just purchase prices — in trying to achieve the "lowest total overall cost."

Private industry and DOD weapon systems managers not constrained by FMC 74-5 can seize on current technology options, but government procurement generally conforms to mid-1960s concepts of the computer industry, the report continued.

"The year 1977 saw a revolution in computer pricing generated by competitive pressures from manufacturers of 'plug-compatible' computers and peripherals. As a result, there are available a host of 'cost technology upgrade' options which can significantly reduce the price of existing computer installations," the report noted.

"The user industry is demanding these . . . options to the extent that a heavy demand backlog exists. Industry recognizes the benefits of these breakthroughs, but the federal government, with its demand for full compe-

tition, is finding that vendors are increasingly interested in offering their leading edge' equipment.

"There is no reason, after all, to engage in expensive federal procurements when demand from other market sectors is so high. The few organizations in the Executive Branch utilizing these new systems are those agencies [which] have obtained waivers from the fully competitive procurement process."

The GSA does not offer requests for proposals (RFP) that normally attract third-party computer vendors, the report pointed out. Avoiding "brand name or equal" or "specific make and model" specifications in the RFPs, "GSA has adopted an overly restrictive interpretation of what constitutes a

truly competitive environment . . . in spite of the universal understanding that competition exists if two or more vendors are able to compete."

The report noted more than 230 people work in GSA's DP procurement organization, while only seven are committed to reviewing federal agency requests for procurement authority — the authority to conduct an acquisition process without GSA supervision.

"With these few people assigned, GSA's review of these procurement requests is neither thorough nor constructive," the Appropriations Committee said. Out of 700 requests for authority during fiscal 1977, GSA granted permission in about 95% of the cases.

The committee's investigative staff

said they found that the armed services have procurement organizations at least as good as that of GSA and that GSA usually delegated most of the work associated with defense DP procurement to military staffs anyway.

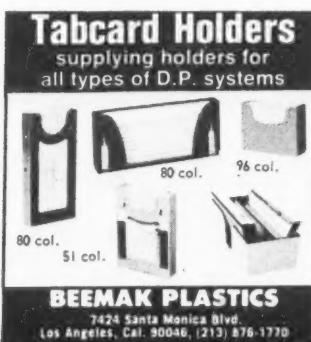
"The military components should be delegated full authority to consummate the entire process of computer systems acquisition without GSA involvement," the committee advised.

The investigators called the current interpretation of the Brooks Act "out of touch with the reality" of today's DP environment, adding that "prior to passage of [the Brooks Act], OMB made known its opposition to the bill, believing [OMB alone] was capable of providing the overall management di-

(Continued on Page 11)

INTERACTIVE CONTROL.

**Why Honeywell's
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... Leaves Brooks Fearing Sole-Source Purchasing

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — Rep. Jack Brooks (D-Texas) has accused a congressional report on DP in the federal government of advocating sole-source rather than competitive procurements of hardware and software.

The approach taken by the House Appropriations Committee in the investigative report on DP attached to a bill authorizing funding for the Defense Department in 1979 (see Page 10) would lead to the use of "antiquated" software, Brooks charged. Ultimately, the report's suggestion that money can be saved by procuring DP systems through such noncompetitive means as brand names would "retard the acquisition of modern technology."

The congressman took special issue with the Appropriations Committee's assertion that the failure of agencies to take software conversion costs into consideration when procuring new DP systems conceals the fact that competitive procurements are not as economical as noncompetitive ones.

Rather than do away with competition, Congress should encourage federal agencies to convert to higher level languages, Brooks said. Higher level languages would permit federal users to employ any brand name of equipment, eliminating the "lock-in" to a particular supplier, he stated.

"Unless agencies are required to properly manage their software, including conversion to standard high-level lan-

guages, they will, to an increasing rate, be required to rely on the costly sole-source method of hardware procurement," Brooks said in a statement printed in the *Congressional Record*.

Not Just Cost Question

While he has "always held the Appropriations Committee in respect," the Democrat from Texas suggested its views lack an "appreciation of the true conditions underlying [DP] procurement policies and practices in the federal government."

He reaffirmed the competitive underpinnings of the Brooks Act, the law he authored in 1965 that has since governed the agencies in their acquisition of DP goods and services.

Beyond his concern for widespread

conversion to standard high-level languages, Brooks decried the report's suggestion "that the longstanding national policy of open competition is no longer applicable to today's environment."

The federal government is not as free as private industry to turn to full competition only when it is cost-beneficial to do so, the congressman said. The federal government has a far greater array of social and political responsibilities, including the promotion of free and open competition.

Calling the report by the Appropriations Committee's investigative staff a "superficial" project, Brooks concluded that the end of competitive procurements of DP and telecommunications resources by the federal government could further impair the competitive acquisition of all goods and services.

Report Charges Policy Vacuum

(Continued from Page 10)

reiction "for federal DP.

"It is conceivable that this philosophy still exists and, therefore, contributes to the uneasy working relationship between OMB and GSA on this issue today," the investigators noted.

Appropriations followed the investigators' advice in recommending that OMB be made the solitary policy director on federal DP procurement. However, the investigators also said "OMB has been ineffectual, producing no policy guidance whatsoever."

The just-released Appropriations report followed and accompanied the committee's acceptance of its investigative staff's report in May. The staff had been directed by the committee "to make a detailed evaluation of the methods and procedures used by the military components of [DOD] to acquire automatic data processing [ADP] systems."

The investigators found that "the existent problems in ADP acquisition are not unique to DOD. In fact, some of the more useful examples exist outside [Defense]." Throughout the government, "the procedural differences are relatively insignificant (although some agencies do a better job than others)," the staff said.

Appropriations also recommended that:

- FMC 74-5 be replaced with an OMB circular emphasizing agency mission and functional needs, rather than just purchase price considerations.
- All significant costs be included when evaluating DP alternatives for the lowest total overall cost.



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The Association For Systems Management Presents the 11th Annual Atlantic Systems Conference, September 25-26, 1978 at Doral Inn, Lexington & 49th St. N.Y., N.Y. Costs: \$115. ASM Member, \$130 Non-member. Contact: Ms. Sandra Paul, (212) 572-2266 or write: ASM, 1 E. 42nd St., Rm. 805, N.Y., N.Y. 10017.

Ethics 'Scenarios' Analyzed

Code of Conduct Arises From Afips Workshop

MENLO PARK, Calif. — "Do what is right, regardless of the consequences." That is the essence of the long-awaited suggested code of conduct resulting from last year's Computer Science and Technology Ethics Workshop sponsored by the American Federation of Information Processing Societies (Afips).

The three-day workshop,

held in March 1977 at Stanford Research Institute under the direction of Donn B. Parker, was funded by the National Science Foundation and drew more than 30 participants representing a variety of disciplines including philosophy and law as well as DP.

The workshop consisted of the analysis of 47 fictitious scenarios "written in such a

way as to raise questions of unethicality rather than ethicality," according to the workshop manuscript.

In an attempt to summarize the results of the workshop in the form of a code of conduct, Paul Strassmann, director of administration and information systems for Xerox Corp. and a principal author of the Institute for the Certification

of Computer Professionals (ICCP) code of ethics, separated the topics into the following categories: disclosure, social responsibility, integrity, conflict of interest, accountability, protection of privacy and personal conduct.

Strassmann did not attend the workshop but only analyzed the final results.

In the category of disclosure,

the workshop attendees recommended that software or information developed during the course of business, using the employer's resources, is not the employee's property.

Attendees also agreed that any samples of work a person shows to prospective employers while he is still employed elsewhere must not address actual ongoing problems or functions of his present employer.

Concerning social responsibility, the group felt DP professionals have an added obligation to use their "special knowledge" in assessing the social consequences of their actions and should try to ensure that their work products are used in a socially responsible way.

Information technology should not be used for any intentional deception, "except where weightiest justification is provided," according to the group, and it is wrong in most cases.

The workshop participants concluded that the designers, assessors and implementors of computer systems should always consider human interests, such as possible job losses, dehumanization, training difficulties or physical danger.

In addition, the group felt it is important for computer professionals to communicate with the general public in comprehensible ways and to correct distortions when they occur.

They found it unethical to use the "aura of the computer" to falsely lend validity to advocates, such as in political surveys, and stressed the documentation for the public of valid data and methods used in computer analyses.

In the area of integrity, Strassmann found the group felt the work of others should be honestly acknowledged and their contributions documented.

(Continued on Page 16)

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General Credit Manager
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Two Sides of ECPS — Part II

IBM Using Microcode as Marketing Tool?

This concludes a two-part series on the technical and marketing implications of IBM's use of microcode. Last week, the author described in detail the technical considerations of Extended Control Program Support (ECPS).

By Charles A. Cornell

Special to CW

The importance of ECPS lies more in philosophical considerations than in technical details; however, those philosophical considerations will have considerable impact on plug-compatible CPU manufacturers and their customers and on IBM's own marketing strategies for systems software.

By introducing a feature available only on mid-range models, IBM ap-

pears to have abandoned a fundamental 360/370 design concept — that of a uniform, upward-compatible series of CPUs.

The implications of a violation of 370 architecture are by no means trivial. IBM owes a great deal of its current position in the DP industry to the introduction of the 360 concept — a uniform architecture for a series of CPUs.

This concept of upward compatibility supports the economical development of operating systems and their attendant processors. It allows software developed for one system to be executed on the next system as users progress through various models in the series.

And, while operating systems such as VM/370 and OS/VS1 obviously have hardware dependencies, almost any release of an operating system could be configured to run on a particular CPU. This is all because of an architecture clearly defined, relatively stable and general enough to allow wide variations in operand values and sequences of instructions.

Neither Clear Nor Stable

The OS/VS1 assist and CPA/VM components of ECPS are a direct violation of this concept of a uniform CPU architecture. The interface between the software and the microcode is not clearly defined or stable (it has already

changed several times) and is so particular in nature that each release of the software must exactly match its corresponding microcode release or the microcode routines are not utilized.

For example, a Release 5 VM/370 will only use the feature on machines that have a VM microcode assist level of 18. Users still running Release 3 of VM either cannot use the assist or must run with outdated microcode.

The impact of ECPS on IBM's effort to market systems software is more obvious. There is no future in trying to charge for versions of VM or VS as they stand. Few users would be willing to pay for the incremental improvements received when the existing versions are free.

Any software enhancements are easy prey for the many excellent software houses that would be able to provide competitive products at a lower price. By tying future releases of operating systems to ill-defined (to the user) and changing microcode features, IBM makes it all but impossible for software houses to compete.

Plug-Compatible Impact

The greatest impact of ECPS, however, is on the IBM plug-compatible CPU industry. This industry has been successful largely because the plug-compatible CPU can run IBM system software without modification. The introduction of ECPS raises the serious question for most plug-compatible manufacturers of whether their products will be able to run future versions of IBM systems which may rely exclusively on microcode routines.

This threat is a serious obstacle to the marketing of plug-compatible CPUs, whether or not IBM continues its shift away from a uniform CPU architecture. Most of the current plug-compatible manufacturers are trying to downplay the importance of ECPS by claiming their products substitute enough power in the basic 370 instruction set to eliminate the need for ECPS. This ignores the basic question of whether future versions of the software will even run on their machines.

In reality, most plug-compatible manufacturers or distributors are not in a position to respond in any other way. The Amdahl Corp. machine is hardwired, making it impractical to add microcode features. The National Semiconductor Corp. machine marketed by Itel Corp. uses 370/158 microcode, which has only a small portion of ECPS. The Hitachi machine marketed by Itel does not have ECPS nor has any announcement been made for its availability.

The Omega 480-II, designed and manufactured by IPL Systems, Inc. and marketed by Control Data Corp., does have the full ECPS feature. The Omega 480-III, due the end of this year, will be the first 3031-class machine with a full ECPS. Even IBM's 370/158 and 3031 have only a small subset of ECPS.

The recent announcement of the availability of the VM component ECPS for 3032 and 3033 CPUs reinforces the belief that ECPS points the way of the future for IBM.

Cornell is director of advanced features development at IPL Systems, Inc. in Waltham, Mass.

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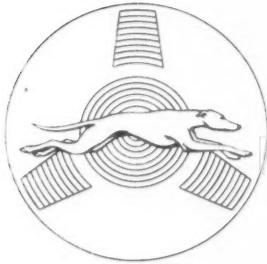
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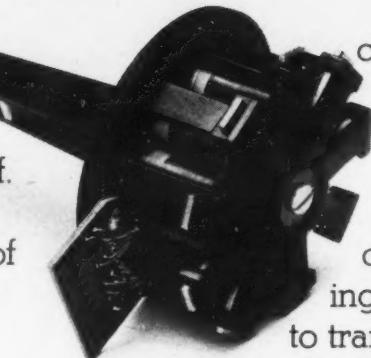
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Afips Headquarters Moving to Washington

MONTVALE, N.J. — The American Federation of Information Processing Societies (Afips) will have a new address by this time next year. Afips will move its national headquarters from Montvale, N.J., to the Washington, D.C., area to better serve its constituent societies, according to Dr. Albert S. Hoagland, Afips president.

The new location is expected to:

- Make Afips headquarters more accessible to members and volunteers.
- Provide a handy meeting facility.
- Promote increased interaction between volunteers and staff personnel.
- Improve communications with the constituent societies as well as various scientific and educational institutions in the Capitol.
- Enable the nonprofit organization

to consolidate its present Washington office with the national headquarters.

The federation's Washington office was established in 1975 by the Afips board to provide a Washington-based information service to the Afips constituent societies and to make technology-related expertise available to governmental groups from Afips

and its constituents. This separate function will be continued under the direct guidance of the Afips Washington Activities Committee but will be able to draw more readily on the additional resources of the headquarters staff, Afips said.

Afips is dedicated to nonprofit scientific, educational and literary purposes

and acts on behalf of its constituent societies in carrying out programs designed to advance information processing as a responsible profession. In addition to its Washington activities program, the federation sponsors the annual National Computer Conference, which recently drew 57,240 attendees in Anaheim, Calif.

Code of Conduct Drawn From Workshop

(Continued from Page 12)

mented.

They also felt that having the power to subvert a system for an unauthorized purpose does not give one the right to do so. This applies no matter how scrupulous the effort to pay all

costs and no matter what subsequent actions are taken to remedy the subversion, the group agreed.

The subject of conflict of interest produced the most recommendations by the attendees, Strassmann found. The workshop group felt that any pos-

sible conflict between an employer's policies and an employee's professional code of ethics should be understood by all parties concerned.

They also felt a consultant has a conflict of interest in performing similar work for two clients who compete with one another, unless he does so with their knowledge and approval.

The group further agreed that an owner's dormancy of interest in his property does not justify appropriation of the property by another party. In addition, they said programmers do not have a property right in programs written or data acquired for others, even in the absence of any agreement stating this.

Among suggestions in the area of accountability was that management of computer services has a professional obligation to actively discourage users from treating computer facilities as a means of self-promotion or for unauthorized use.

The group also said computer personnel who have reason to believe they may be supporting a criminal or illegal act should stop their involvement, adding, "culpability exists if available facts are willfully ignored."

Finally, also in that area, attendees agreed that when a systems professional is given only partial authority or inadequate resources to perform his work and the results are bad, he cannot be held responsible for factors outside his control provided he clearly communicated the anticipated outcome in advance to management personnel with full responsibility for the work.

Regarding privacy, workshop participants observed that reporting knowledge of a system weakness does not remove the ethical responsibility not to exploit the discovered weakness.

In the case of accidental access to proprietary software or data, the group urged that action be taken to notify the rightful owner and compensate for any gains realized.

The group felt it is justifiable to expose inadequate protection of computer data confidentiality if the personal rights of others are safeguarded and if the proper internal channels for disclosure are utilized first.



Center for Computer and Information Sciences

Mr. John R. Hillegass
Executive Editor
DATAPRO Research Corporation
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Please accept this letter of thanks from a very satisfied subscriber and customer.

Sincerely,

George J. Germann

George J. Germann
Director, The Center for Computer and Information Sciences.

GJG:rbc

What more can we say?

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Poolside System Smooths Scoring, Lane Assignments At National Swim Meet

By Tim Scannell
CW Staff

THE WOODLANDS, Texas — Both as a competitive sport and a recreational activity, swimming basically requires little more than a moderately sized body of water and a series of steady strokes and kicks from the participant.

But the National Amateur Athletic Union's (AAU) long-course swimming championships and World Team trials, recently held here, added a new ripple to this aquatic endeavor — computers.

More than 700 swimmers competing in the five-day games participated in some 30 events ranging from the 100-meter breaststroke and butterfly to the 400-meter freestyle. During the competition, athletes were monitored

Housed in two trailers (above right), a computer system monitored the results of the national AAU swim meet at The Woodlands. Below, swimmers times were tallied as soon as each event was completed.

tive competitive histories. Faster swimmers were assigned to the center, more turbulent lanes of the pool while slower swimmers were allotted the relatively smoother outside lanes.

Officials using several TI911 CRT terminals linked on-line to the host computer registered each swimmer's time and maintained a constant record of individual and team scores. The

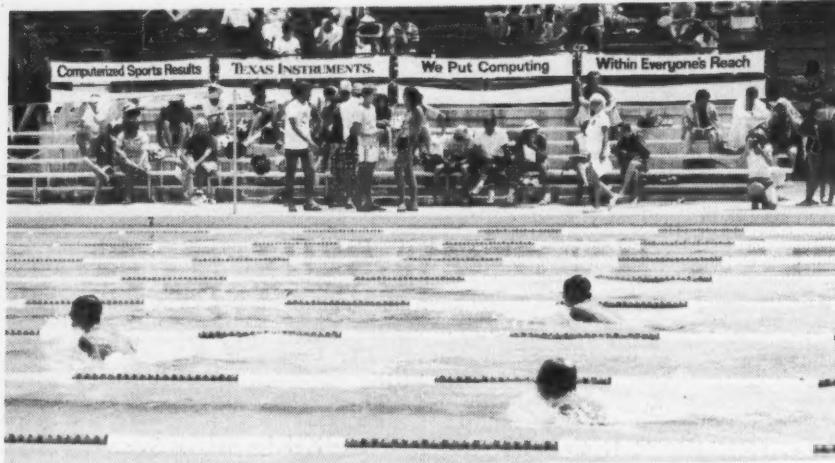


Photo by Dick Crosset

and scored by a Texas Instruments, Inc. DS990 system located poolside in two 8- by 24-foot trailers.

The computer not only recorded each participant's time, but also assigned swimmers to specific heats and lanes for each event based on their respec-

Caltech Chair Funded to Honor TRW's Ramos

CLEVELAND — The California Institute of Technology (Caltech) has received gifts and pledges of \$1 million to endow the Simon Ramo Professorship of Engineering. Caltech President Marvin L. Goldberger and Dr. R.F. Mettler, chairman of TRW, Inc., have jointly announced.

The professorship will honor Simon Ramo, who retired in June as vice-chairman of the board of directors and chairman of the Executive Committee of TRW. Ramo continues as a member of TRW's board of directors and chairman of TRW's Science and Technology Committee.

Ramo, who received his Ph.D. magna cum laude from Caltech in 1936 at age 23, is a member of the institute's board of trustees and is chairman of the Visiting Committee of the Division of Engineering and Applied Science.

Endowment of the professorship was made possible by gifts from Ramo and the TRW Foundation. A distinguished engineer will soon be named as the first Ramo professor, Goldberger said.

computer was then used to select finalists and consolation members from each event and provide a hard-copy printout of the proceedings via a peripheral printing unit.

A total of four world and three national records were broken during the competition, which was the first national swim meet to be completely monitored and controlled by a computer.

Kim Linehan, a 15-year-old from Sarasota, Fla., placed first in the 400-meter freestyle with the record-shattering time of 4:07.81 — 1.1 seconds faster than the previous world record. Linehan credited her win to a rigorous training schedule of five hours a day, six days a week, and to an assortment of stuffed animals she carried with her to the starting block for luck.

According to Coach Tim Blood, Linehan's most valuable quality is not her physical strength or abundance of natural talent, but simply her distaste for losing.

"She looks at the long-range results of the work," Blood said, ignoring the pain and concentrating on "time drops, national championships and perhaps the Olympics."

Linehan, along with 44 other swimmers selected by the computer, is scheduled to compete this week in the World Championship Games in West Berlin. During those games, top-ranked swimmers representing countries around the world will vie for the chance to be internationally rated as No. 1.



Photo by Rosanne Clark

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Proposals...a guide to Winning

A unique step-by-step guide to proposal preparation is providing the winning edge to computer/EDP marketers in their proposal efforts. *How to Create a Winning Proposal*, an innovative "how to," is so effective it is rapidly becoming the standard text for use in government, commercial and OEM proposal projects. It is currently in use by 74% of the nation's major computer/EDP equipment manufacturers, and 62% of the data base management and service organizations.

The book covers the entire proposal process, giving detailed instructions on contents, structure and methods of preparation for both solicited and unsolicited proposals. Technical, cost and management section checklists are included to ensure the proposal team of covering all the important bases. Excellent guidelines are provided on how to analyze and respond to RFP's, RFQ's and IFB's.

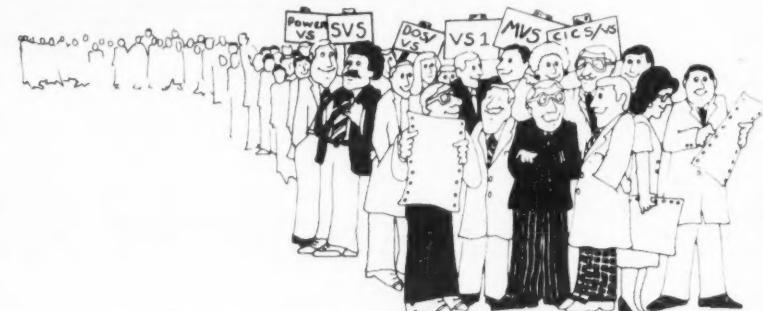
Government requirements are covered in an overview of the US procurement network, how it works, and how the proposing firm can increase its "win probability" in competing for contracts. Other topics covered include:

- How to develop an effective "win strategy," mobilize the proposal team, and control the input of the various team members.
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Sept. 6-7, El Paso, Texas — **Third Annual Data Processing Management Association (DPMA) Computer Show & Exposition**, sponsored by El Paso DPMA Chapter. Contact: Giff Babcock, President, El Paso DPMA Chapter, P.O. Box 1894, El Paso, Texas 79950.

Sept. 14-15, Chicago — **Planners League Meeting**, sponsored by Execucom Systems Corp. Contact: Dr. Rosemary Edwards, Execucom, P.O. Box 9758, Austin, Texas 78766.

Sept. 19-20, New York — **Computer Technology Seminar**, sponsored by Martin Simpson Research Associates, Inc. Contact: Martin Simpson Associates, Department CS, 63 Wall St., New York, N.Y. 10005.

Oct. 1-3, Carmel, Calif. — **Micro-**

graphics' Role in Future Information Systems, sponsored by the Industries for Graphics Communication, Inc. Contact: Richard D. Murray, Director of Conferences, Institute for Graphic Communications, 375 Commonwealth Ave., Boston, Mass. 02115.

Oct. 2-4, Hartford, Conn. — **Data Base Systems**, sponsored by the Hartford Graduate Center. Contact: Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

Oct. 2-4, Hartford, Conn. — **Structured Design Workshop**, sponsored by the Hartford Graduate Center. Contact: Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

Oct. 2-4, Cincinnati, Ohio — **Seminal Knock-About**, sponsored by the Cincom Users Group. Contact: Direc-

tor of Knock-About, Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

Oct. 2-4, Atlanta — **Course on the Fundamentals of Data Processing for Noncomputer Types**, sponsored by American Management Associations (AMA). Contact: Alan Freedman, AMA, 135 W. 50th St., New York, N.Y. 10020. Also being held Oct. 9-11 in Philadelphia and Oct. 23-25 in Chicago.

Oct. 2-4, Chicago — **Disaster-Recovery Plan Development Workshop**, sponsored by Management Dimensions Corp. Contact: Carole Flackoy, 1754 E. Morada Place, Alameda, Calif. 94501. Also being held in Minneapolis Oct. 10-12.

Oct. 2-5, Rocquencourt, France —

Second International Colloquium on Operational Systems. Contact: Secrétariat du Second Colloque International sur les Systèmes d'Exploitation, Institut de Recherche d'Informatique et d'Automatique, Service des Relations Externes, Domaine de Voluceau, BP 105 - Rocquencourt 78150, Le Chesnay, France.

Oct. 4-6, Chicago — **Data Communications: An Introduction to Concepts and Systems**, sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 18-20 in Washington, D.C.

Oct. 4-6, Chicago — **Data Base Management Systems**, sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 4-6, New York — **DP Project Management: A Practical Approach**, sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 4-6, San Francisco — **Data Communications: Effective Network Design**, sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 4-6, New York — **Integration of Word Processing and DP Systems**, sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 8-11, Washington, D.C. — **23rd Annual Conference of the Association of Records Managers and Administrators (Arma)**. Contact: Arma, P.O. Box 281, Bradford, R.I. 02808.

Oct. 9-10, New Orleans — **Financial Management Seminar**, sponsored by Remote Computing Corp. Contact: Remote Computing Corp., 1076 E. Meadow Circle, Palo Alto, Calif. 94303.

Oct. 9-13, Pittsburgh, Pa. — **Microcomputing Workshop**, sponsored by Carnegie Institute of Technology, Mellon Institute of Science, Carnegie Mellon University. Contact: Post-College Professional Education, Carnegie Institute of Technology, Schenley Park, Pittsburgh, Pa. 15213.

Oct. 10-12, Hartford, Conn. — **Course on Microprocessors**, sponsored by the Hartford Graduate Center. Contact: Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

Oct. 10-12, Hartford, Conn. — **Course on Data Set Organization**, sponsored by the Hartford Graduate Center. Contact: Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

Oct. 10-12, San Francisco — **Third U.S.A.-Japan Computer Conference**, sponsored by the American Federation of Information Processing Societies (Afips). Contact: J.D. Madden, U.S. Chairman, third U.S.A.-Japan Computer Conference, Afips, 210 Summit Ave., Montvale, N.J. 07645.

Oct. 11-13, Chicago — **Association of System 2000 Users for Technical Exchange (Astute)**. Contact: Susan Trueblood, Auerbach Associates, Inc., P.O. Box 290, Germantown, MD 20767.

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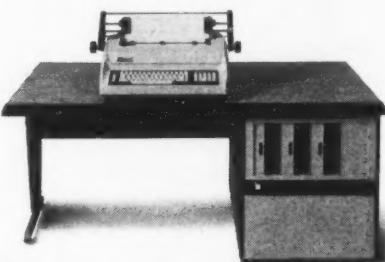
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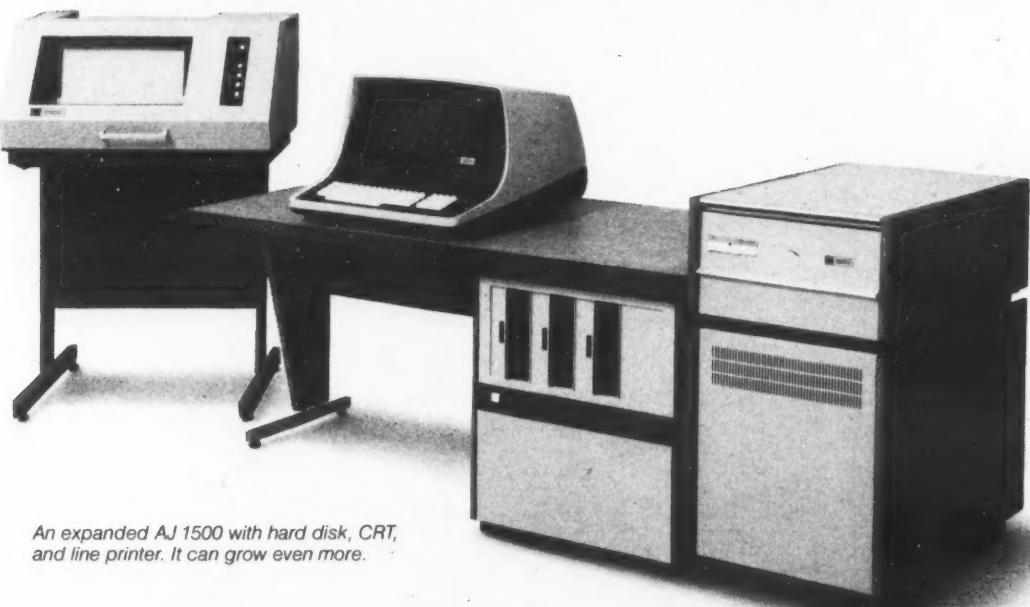
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West Eyeing Peking 'Supercomputer' Progress

By Bohdan O. Szuprowicz

Special to CW

A group of American scientists who visited China as the first delegation of the Institute of Electrical and Electronics Engineers (IEEE) last October reported the existence of a new Chinese "supercomputer" rated in performance at two million instructions per second (Mips). The 10-man delegation, which was partly sponsored by the National Science Foundation, spent a month in China at the invitation of the Chinese Electronics Society and visited research institutes and manufacturing

plants in Peking, Nanking, Shanghai and Canton.

Members of the group represented several prestigious organizations such as IBM, Bell Laboratories, the University of California, MIT Lincoln Laboratories, the Mitre Corp., Harvard University and ROLM Corp., a minicomputer manufacturer specializing in "ruggedized" computer hardware.

Although the delegation's primary mission was to assess the state of the art in Chinese telecommunications, some members of the group also visited computer research and manufacturing facilities.

Chief among those were the Peking Institute of Computing Technology of the Chinese Academy of Sciences; the Shanghai Radio Factory No. 13, the second largest computer manufacturing plant in China; the Shanghai Radio Factory No. 14, which produces integrated circuits; and the Nanking Telecommunications Factory where computers, peripherals and calculators are also produced.

It was probably the first time Western observers had an opportunity to visit the plant in Nanking, which was recently in the news as the manufacturer of the first Chinese satellite communications ground stations. Nanking, together with Peking, Shanghai, Tientsin, Chengtu, Sian and Canton, is a major electronics manufacturing center in China.

Catching Up

Members of the delegation in general were of the opinion that the Chinese are about 10 to 15 years behind the West in electrical and electronics technology. They also thought that if basic research, manufacturing and, above all, educational problems are resolved and those systems modernized, China could reach its stated goals of equaling or even surpassing industrialized nations in this area by the year 2000.

With electronics production already estimated at about \$4 billion per year — which is comparable to the total electronics markets in countries like Canada, the UK or E. Germany — China is among the 10 or even seven top electronics manufacturing countries in the world.

Reports of computer hardware developments at the Peking Institute of Computing Technology provide the most interesting insights into China's progress in developing its own "supercomputer." The IEEE visitors were shown, for the first time, the Model 013 computer, which is the latest and fastest of the original Chinese number crunchers.

It is a 48-bit word machine with an execution speed of 2 Mips. This average speed was apparently recorded by an internal statistical monitor and pertains to a scientific job-stream including matrix inversions, differential equations and the like.

The main storage of Model 013 was reported to be 1M byte consisting of a combination of permalloy film-on-glass, magnetic core and read-only memory (ROM). The 16K words of ROM storage have a 400-nsec access time and are used to store some of the operating system. The fastest memory is the 512 words of film, which have an

access time of 300 nsec. The prevailing logic technology is bipolar MSI with five gates per chip and was judged by the IEEE visitors to be about five to six years behind similar developments in the West.

The scientists were particularly impressed by the institute's progress in design and development of Chinese peripherals. Among the most interesting peripherals seen in operation with the Model 013 were two units of Chinese disk drives each reported to have a 10M-byte storage capacity. According to the Chinese, the disks were developed at the institute in 1975. Chinese disk drives use stacks of 12 double-sided disks and are said to have a 750-msec access time.

There was also an electrostatic dot matrix printer claimed to have the capacity of printing 120 char./line at 1,800 line/min. Work was under way to adapt this printer to handle Chinese characters.

It is significant to realize that with these latest achievements, China has developed computer hardware comparable in operating characteristics to that used by the U.S. and the Soviet Union during the 1960s to put their astronauts

and cosmonauts into orbit.

China has already launched eight satellites of its own and sinologists speculate that a Chinese manned orbital flight is in the making. Chances are it will take place in 1979 to celebrate the 30th anniversary of the Chinese Revolution and will be also used to demonstrate, particularly to the Third World, that the "four modernizations" now claimed to be under way in China are not just political rhetoric.

The greatest political prize China may yet try to win is putting a man on the moon ahead of the Russians. Computers with speeds in order of 10 Mips are probably crucial to such an undertaking. Perhaps this is the reason the latest National Plan for the Development of Science and Technology 1978-1985 put so much stress on development of very large scale integrated circuits (VLSI) and giant computers in China.

But time is running out because with the announcement of the Elbruz computer series with maximum design speeds of over 100 Mips, the Russians are in fact implying that they too are developing VLSI technology and computers in a hurry.

International Seminar To Focus on Security

LOS ANGELES — An international seminar presented by the American Society for Industrial Security (Asis) that will feature lectures and discussions addressed to DP security for public- and private-sector organizations is slated for Sept. 18-21 at the Bonaventure Hotel here.

This 24th annual seminar will also feature exhibits of computer security products,

according to an Asis spokesman.

About 2,000 security experts are expected to attend the seminar. Registration fees for non-Asis members are \$160 for the full four days and \$65 for a single day; member fees are \$125 and \$40, respectively.

Additional information is available from Asis, Suite 651, 2000 K St. N.W., Washington, D.C. 20006.

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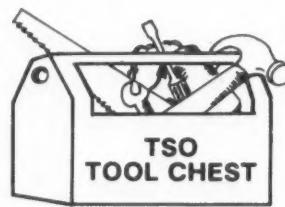
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DBMS Meet to Focus On User Viewpoint

LOS ANGELES — Understanding data base management systems (DBMS) from a user's point of view will be the focus of a three-day seminar sponsored by the University of California at Los Angeles (UCLA) Extension here Sept. 18-20.

The Seventh Comparative Data Base Management Systems National Conference is geared toward the prospective user and will reportedly feature presentations on 20 of the most popular systems on the market today.

Participants will be shown each system's capabilities and partake in "hands-on" testing of sample data bases, according to a spokesman.

The conference will also feature comparative evaluations and a variety of information

pertaining to the selection of the most appropriate system for a particular company's use, the spokesman continued.

Registration fees for the entire session are \$375. Additional information and details can be obtained from, UCLA's Management and Business Division, P.O. Box 24902, Los Angeles, Calif. 90024.

IAC/ADP Honors Oyer With Management Award

WASHINGTON, D.C. — The Interagency Committee on Automatic Data Processing (IAC/ADP), a government-wide organization that provides a forum for DP managers in the federal government, recently presented its Senior Management Award to Paul D. Oyer, planning officer with the U.S. Treasury Department.

Oyer was given the award in recognition of his leadership as president of the Federal Automatic Data Processing Users Group (Fadpug), a volunteer organization of managers and senior technicians. His efforts in expanding the membership and activities of this group were noted.

Oyer served as president of

Fadpug from 1976 to 1978, during which time the membership grew from 407 to more than 1,700 members.

Oyer also played a key role in selecting DP experts from both the private and federal government sectors to serve on President Carter's reorganization project.

Nominees for the Senior Management Award are solicited annually from all federal government departments, agencies and bureaus. Winners are recognized for past accomplishments "where the results can be measured in terms of improvement of service, in substantial savings or in significant technological progress," the spokesman explained.

NBS Opens Interface Research To DP Scientists, Engineers

WASHINGTON, D.C. — Industry and government representatives will have a chance to discuss and develop the technical foundations for future computer interface standards through a cooperative program recently established by the National Bureau of Standards (NBS).

The NBS' Research Associates Program is designed to allow scientists and engineers sponsored by industrial, trade and other organizations to work with NBS staff on projects of mutual interest for a specified period

of time. Proposals will focus on computer systems and network architectures most likely to be in widespread use within the next five to 10 years, a spokesman said.

Areas of investigation will include formal and informal methods of describing interfaces and related higher level protocols.

Organizations interested in participating in the joint effort can write Thomas N. Pyke Jr., Computer Systems Engineering Division, A231 Technology Building, NBS Headquarters, Washington, D.C. 20234.

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IN DEPTH
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IN DEPTH

Boston Residents Fight Fire With Facts And a System Is Born

By Jack Canavan

On Oct. 17, 1977, in a dramatic series of predawn raids in the greater Boston area, Massachusetts State Police arrested 22 persons in connection with what was described by officials as "the largest arson ring ever uncovered in the U.S."

The raids were the culmination of investigative work by a group of community workers upset by what they felt was a lack of response from law enforcement officials in controlling the outbreak of apparent arson in their community.

Since 1973, a series of twenty-five suspicious fires in the Fenway area of Boston had killed five people, destroyed more than 30 buildings, left hundreds homeless and caused an estimated \$6 million in property loss. "The people were afraid to lie down and go to sleep," one tenant recalled.

An arsonist was on the loose, but nobody seemed to care. It was not until a fatal fire in September 1976 claimed the life of a four-year-old neighborhood boy, Jessie Oliver, that angered community residents would launch a probe that focused national attention on the problem of arson.

The Symphony Tenants' Organizing Project (Stop), a group with some 30 members, was formed about seven years ago in response to substandard housing conditions in the Fenway, an area around Symphony Hall. Leaders of the group are not representative of the neighborhood's lower class residents. Most are college-educated, political activists with degrees in economics, mathematics and social work from Harvard, Northeastern and MIT.

David Sondras, key organizer of Stop, wrote his master's thesis in economics on the Fenway neighborhood in which he had been a resident for 10 years. When Stop began the arson probe, he turned to that data — which showed it was more profitable for landlords to burn their buildings than to rent or manage them.

This, they found, was chiefly a result of insurance settlements on property where the paper value had been substantially but artificially inflated. Stop traced the history of a dozen fire-razed buildings through local real estate records, and patterns of ownership were established which would form the core of Stop's arson analysis.

Attempts by the group to present their findings were futile until another fatal fire in the same area killed four people and prompted Stop to conduct a media blitz. Appearances on local television and radio talk shows, along with several articles in the newspapers, generated public pressure, and Stop was finally allowed to present its information before Massachusetts Attorney General Francis X. Bellotti.



Photo by Bill Noonan

This Dec. 7, 1975 fire on Louis Prang St. in the Fenway area of Boston took one life.

vision and radio talk shows, along with several articles in the newspapers, generated public pressure, and Stop was finally allowed to present its information before Massachusetts Attorney General Francis X. Bellotti.

In the words of Assistant Attorney General Stephen Delinsky, head of the resulting arson task force, "We were amazed by the work of the tenants in establishing patterns of ownership. They organized and fought their way

into recognition."

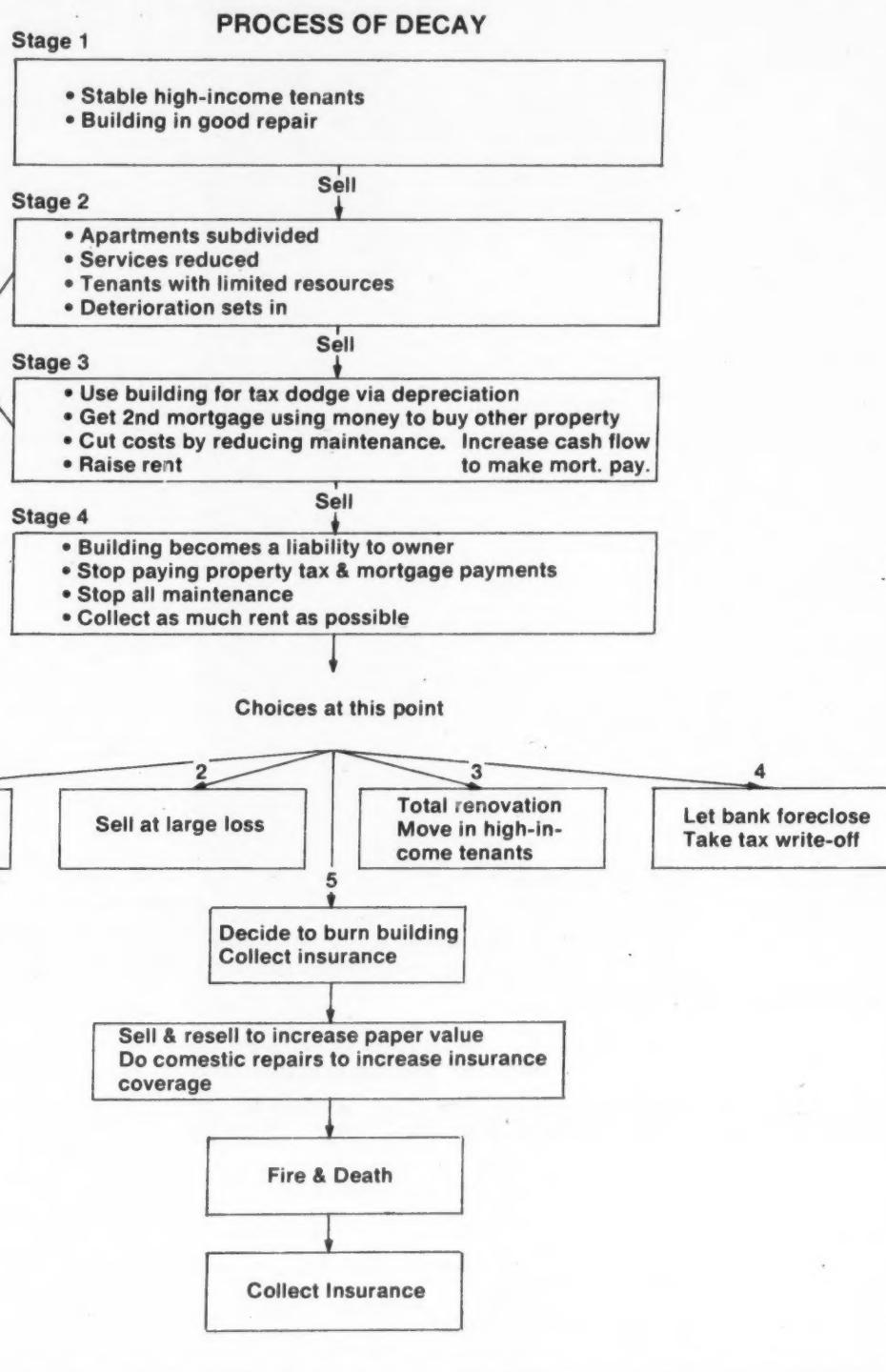
In all, 33 indictments were handed down in the huge arson-for-profit ring that involved former police and fire officials, lawyers, realtors, insurance brokers and other prominent business-

Arson is a lucrative crime. Its target is often buildings whose paper values have been artificially inflated, resulting in hefty insurance claim settlements.

But arson is also a heartbreak crime. Arson-related fires killed more than 1,000 people in 1976, a year in which they also injured 10,000 others and caused more than \$2 billion in property damage. If this trend continues unabated, arson will be the leading type of murder by 1982.

In Boston, a group of residents living in an area beset by arson-for-profit fires have developed a system to predict them. Its use could help curb this contemptible way of making a buck.

IN DEPTH IN DEPTH IN DEPTH



The Early Warning System is based on variables that form a pattern in the deterioration of urban multifamily housing.

men. To date, seven of those people have been tried, convicted and sentenced, including a former State Police lieutenant assigned as chief investigator in the State Fire Marshall's Office. Trials are continuing for the remaining

suspects.

Arson is the fastest growing, most expensive crime in America today. National Fire Protection Association figures show that in 1966 approximately 40,000 arson incidents were recorded.

In 1975, that figure leaped to an alarming 144,100 arson-related fires causing over \$633.9 million in property damage.

A recent *New York Times* study showed there were an estimated

150,000 arson-caused fires nationally in 1976 with a loss of \$2 billion. In that same year, arson fires killed more than 1,000 people and injured 10,000 others.

If the problem continues to grow unchecked, authorities predict that by 1982 deaths from arson will surpass all other murders in the U.S.

According to experts in the field, motives for arson generally fall into four categories:

- *Arson for revenge.* This includes domestic problems and arson with the intent to cover up another crime.
- *Arson by vandals.* This usually involves abandoned buildings.
- *Arson by the mentally disturbed.* Here we have the pyromaniacs and those who get kicks from watching fires.
- *Arson for profit.* In this, the largest category by far, buildings are deliberately burned for insurance money or to make way for new construction.

Law enforcement officials have for too long held to the traditional theory that arson is one of the hardest crimes to prove — that the perpetrator must be caught in the act. Experts believe this to be one of the main reasons for the phenomenal rise of arson in this country and why arson has become such a profitable business — a relief valve for victims of economic conditions.

Stop's efforts have not only helped to dispel that theory but, as a result of its investigations, local, state and government agencies are taking a closer look at existing arson legislation.

Meanwhile, the war on arson in the community goes on. In Boston, Stop continues to fight arson and building abandonment at the neighborhood level, while some of its members are conducting the battle on a larger, more modern scale.

Urban Educational Systems, Inc. (UES) is an outgrowth of Stop. Key members include Stop's David Sondras, an economist and computer specialist; Ernest Garneau, a specialist in community housing and financing; Harvey Schmidt, a private arson investigator and research expert; Mark Zanger, investigative reporter; Gay Martin, Stop member and former nurse specializing in administration; Michael Moore, administrative assistant; and Helene Johnson, political activist who will work in administration and public relations.

In anticipation of a \$180,000 federal grant, UES is in the process of developing

(Continued on Page 24)

FIGHTING FIRE WITH FACTS

Page 24

(Continued from Page 23) opening its copyrighted Early Warning System (EWS), a computerized method for detecting arson-prone buildings in a community.

The idea first came to Sondras in 1977, when he realized the potential of the background information he had collected on torched and abandoned buildings. From this collection of facts in his card file, Sondras felt he could predict, fairly accurately, the arson and abandonment trend of a neighbor-

hood. What would the outcome be, he wondered, if these and similar facts were fed into a computer?

The idea was intriguing. After discussing it with Garneau, they decided — with the help and support of Congressman Joseph Moakley of Massachusetts — to take their idea to Washington, D.C. They appeared at a hearing before Sen. John Glenn (D-Ohio) and requested federal assistance for the project. The idea was well received and soon had the support of Massa-

chusetts Lt. Gov. Thomas O'Neill, the project's official sponsor.

The Early Warning System is described as a self-updating, compact and economical system that can be readily adapted to any urban area. By feeding in information about a building — its owners, tenants, the neighborhood and prevailing economic conditions — EWS can, the group claims, predict the outcome of a building with a reliability factor approaching 85% to 90%.

"When you think about it," Garneau said, "it's kind of weird that a little ragtag band of community workers could figure out the formula and tell the rest of the community, 'This building is

Further information on the Early Warning System program is available from David Sondras or Gay Martin at Urban Educational Systems, Inc., 120 Milk St., Boston, Mass. 02109. The telephone number there is (617) 482-4477.

going to burn next' — and that building would burn next!"

According to UES, the system will contain approximately 75 variables or indexes, of which approximately 60 are common to any urban area. The remaining 15 variables are easily programmed into the system according to the locale in which the system is deployed.

The system is based on a pattern of deterioration common to urban multi-family housing, as shown in the chart on Page 23.

A simple manual version for those not having access to a computer is also being developed, and both systems are expected to be available shortly.

The EWS is primarily designed for use by neighborhood organizations and can provide these groups with an invaluable tool in helping to stem the cycle of neighborhood decline before it becomes uncontrollable. Otherwise, many man-hours would be wasted attempting to control the elusive arson and abandonment problems.

EWS can also be used by the following departments of a municipality:

- **Fire Department:** to predict fire trends in arson-prone areas and to assist in gathering evidence at suspicious fires.

- **Police Department:** to collect circumstantial evidence for use in prosecution.

- **Housing Inspection Departments:** to prevent the "milking" of properties that eventually leads to deterioration, unlivable conditions, condemnations, abandonment and fire.

- **Planning Departments:** to assist in channeling local, state and federal funds to reverse the cycle of decline.

- **Assessing Departments:** to detect owners who exploit property by not paying taxes for the years preceding a fire.

What began as an effort by private citizens to combat arson and deterioration in the community will end, hopefully, in a sophisticated computer system capable of predicting and thereby preventing the destruction of our country's lifeline — the neighborhoods.

Canavan is a Boston firefighter and freelance writer.

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*Units installed. IDC's EDP Industry Report, 4/22/77; updated 1/1/78 for EDP/IR Review & Forecast Issue. Dataquest Mini-computer Industry Service Report, 2/3/78.

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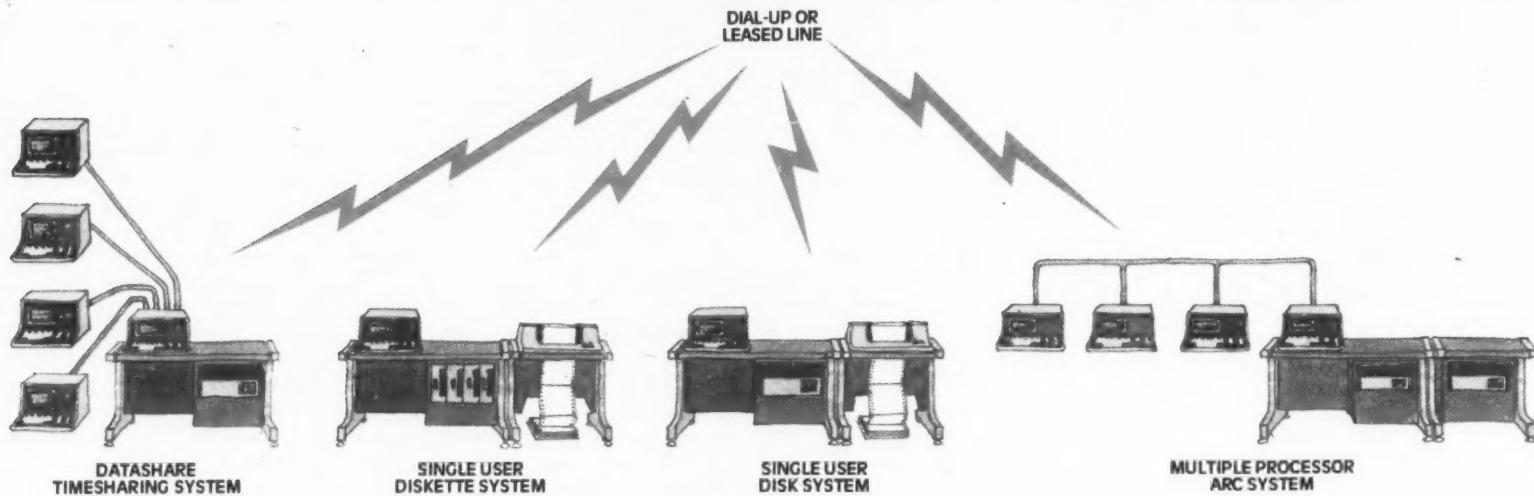
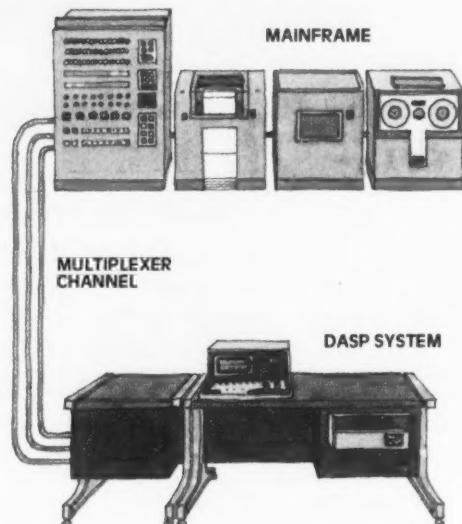
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Editorial

Unwise Recommendation

The federal government's DP procurement procedures must be revised before federal DP operations stagnate. But reformer's zeal should be tempered with common sense.

It does seem shocking that 80% of federal computer systems are at least six years old, while the other 20% are more than three years old, according to "major computer vendors" regularly selling to the federal government.

Of course, not all computer systems used by the federal government need be state-of-the-art. Many systems built years ago are performing well today and may continue to do so in the future.

Yet, "in the rapidly changing computer industry, three years represents a point of obsolescence," a recent report to the U.S. House of Representatives Appropriations Committee has noted [CW, Aug. 21].

In this report, investigators told the committee that "a typical [federal] procurement cycle for major systems will last two years [and] if a vendor should protest, the procurement can be stretched out to three years or more."

"To this must be added the year between the vendor's equipment announcement and the first mention of this availability on the General Services Administration (GSA) schedule," the investigators continued. "By the time the brand new equipment is delivered to the government, it is at least three years old if there is no protest, or more than four years old if it is protested."

The investigators recommended that GSA revise the rules for qual-

ifying mainframe announcements to appear on the agency's general schedule and that "established major vendors with proven performance ... be permitted immediate access to the schedule."

"Major vendors" should not have the inside track on selling to the federal government. Unless the Appropriations investigators misstated their views, it seems they want GSA to provide this advantage — which would clearly work to the detriment of not-so-major vendors, while making the government even more subject to the political influence of the industry giants.

Suppose federal DP facilities almost exclusively employed the products of two or three vendors at installations vital to national security and stability. At times of crisis, the government would be forced to defer significantly to the policies of these vendors — at cross-purposes with the public interest.

This particular recommendation to the Appropriations Committee would clearly jeopardize free enterprise and might provoke the absurdity of constant Justice Department antitrust prosecution against the industry giants while antitrust violations are invited by other government branches, such as GSA.

The focus of attempts at improving federal DP procurement practices should be on streamlining the government's planning and review processes without sacrificing quality, not on narrowing the field of contestants for federal contracts.

The key here is government mismanagement, not what is being mismanaged.



Letters to the Editor

Thanks for In-Depth

I commend Tom DeMarco and Computerworld for writing and printing the excellent series of articles on structured design [CW, Aug. 7, 14, 21].

Two additional software technologies would significantly simplify structured design.

The first involves abandoning Ansi flowcharts for the graphic presentation of algorithms. The block-oriented notation of Nassi and Shneiderman (August 1973, Sigplan Notices) is far superior for proper program design.

The second technology is the use of precompilers for structured programming in languages like Cobol and Fortran.

We'll be looking for more articles like DeMarco's.

Martha J. Cichelli

Allentown, Pa.

tive computer performance evaluation will develop an integrated system of hardware and software monitors to meet its performance goals.

Bill Kochuk

Columbus, Ohio

In Support of Arbitration

The Taylor Report of July 31 referred to the use of arbitration in contract disputes as a "growing fashion." Such a trend is welcome because arbitration offers an alternative to often lengthy and costly court cases. The report, however, contained some erroneous and misleading comments:

First, contractual rights are not "sacrificed" by using arbitration, as Taylor suggested. No contractual rights are ignored. The arbitrator interprets the contract according to the normal principles of contract interpretation. The forum for resolving a dispute changes but not the principles.

In addition, the Taylor Report suggested that arbitration is so quick — "less than a month or two" — that the user has little time to explore options such as counterclaims against the vendor. Arbitration generally takes at least four months and counterclaims are quite frequent.

Citing his "experience in complex cases," Taylor expressed his doubts on whether arbitration is really a less expensive alternative for the user. In suggesting this, he did his readers a great disservice.

Arbitration is proving itself a less costly and more efficient method of solving disputes and leading members of U.S. and state courts are calling for its increased use. The only people who "sacrifice" anything are those whose fees are a function of the length and complexity of court cases.

Ben E. Olive

NCR Corp.
Dayton, Ohio

Data Past

Five Years Ago

Sept. 5, 1973

ATLANTA — A user benchmark discussed here showed it might be more cost-effective to operate an IBM 370/145 with OS/MFT than with OS/VS1 by extending the real memory capacity from 512K- to 768K bytes or 1M byte. The additional memory would allow the system to support more problem partitions and would permit the use of Hasp for I/O operations. In addition, it would provide operating system module residencies, without the excessive supervisory overhead encountered in OS/VS1. The test was done at Western Electric Co.'s Computer Applications Study organization.

—

ATLANTA — After a year's study of computer systems that contained personal information, most of the members of a government task force had less faith in the ability of

technicians to solve problems with such systems, Guy Dobbs, vice-president of Xerox Computer Services, told a meeting of the Association for Computing Machinery here.

Eight Years Ago

Sept. 9, 1970

NEW YORK — Data processing Financial & General Corp. announced an out-of-court settlement of its antitrust suit against IBM. IBM confirmed that the terms involved refinancing the leasing company's \$42 million debt to IBM, plus renumeration for "legal costs."

—

NEW YORK — William Ellinghaus, executive vice-president of AT&T, predicted an AT&T data network using long-haul digital carrier systems with both microwave and coaxial cable technologies would be ready for operation in the mid-1970s.

Use of Monitors Ignored

"Best Tuning Seen Bleeding Optional Tools" [CW, Aug. 14] ignored the abilities of current hardware monitors in a "complete performance management system."

Hardware monitors can sample at rates varying from less than 10 sample/sec to more than 10 million sample/sec. This sampling imposes no overhead in terms of either CPU time or core storage.

Since a hardware monitor is not resident in or bound by any one system, simultaneous measurements can be made of multiple mainframes, controllers, disk drives, tape drives and other peripherals. In addition, hardware monitors are not brand-, model- or operating system-dependent.

The best hardware monitor systems are modular, portable and expandable to meet increased measurement needs at a small incremental cost.

The company interested in effec-

The Human Connection

Micro Users Need Applications Packages

By Jack Stone

Special to CW

When I reflect on the advertising and other promotional copy touting micro systems for small business, it becomes clear the vendors are pushing the custom capabilities of their machines. This strategy, is obviously forced on the vendors because of the dearth of decent applications software in the marketplace, at least at this point in the development of the industry.

Unfortunately, based on my experience of owning and operating a micro for my own practice as an independent writer/consultant/trainer, the customization strategy, I feel, acts to deter rather than abet sales, if the buyer is alert to the myriad problems associated with in-house development.

There really is no question in my mind that with or without a DP background, a person running a small business shouldn't be taking time away from normal business activities to fool around with programming and all the hassles associated with it, unless, of course, he is in the programming business or a bona fide, wild-eyed hobbyist.

There is, however, one area of applications for micro systems (which I am defining as costing less than \$6,000 — used to be \$5,000, but there is inflation) which appears to be a front-runner, and that is word processing.

A computer-based folk hero/OEM by the name of Michael Shrayer has let loose in the market for a \$150 one-time charge, a whizbang program called the "Electric Pencil" which contains everything you ever wanted for your word processing needs. (At least I thought it did, until I learned of his new release, which has extended the universe of the application into the outer galaxies.)

And speaking about far-out, the expression "lack of compatibility" takes on new meaning in the micro market. All the machine vendors do their own thing, like use their private dialect or Extended Basic. For poor suffering Shrayer, this situation translates into the support of six (count 'em) different versions of his software, for various combinations of printer, CRT and disk storage interface units. (I have to assume that with his new release, he

is supporting a mere 12. When does he have time to eat?)

I've just got to tell you about some of the key capabilities of the "Pencil," related to my major need for a high-performance processor to help me generate (hopefully) high-performance words — for articles, papers, books and learning materials.

Shrayer uses "string processing," which gives the user much more freedom from machine constraints than conventional software (sound familiar?).

As I enter on my CRT and reach the end of my line (64 characters), do I stop and hit "return"? No. I just keep typing. This software jewel unleashes its partial word sensor and shifts the next word down to the beginning of the next line.

Other neat features are these:

- Line-level scrolling, forward and reverse, at five different speeds (it would be nicer still, if Mike includes a scroll-by-page feature in his next release.)
- Search-for-string function, with a replace option. In addition, encoded strings can be set up as codes for various records and the user can

search for and create selective files.

- You can mark a sentence or paragraph at its start and end and move it to the cursor position with a mere flick of a finger, then delete it with another one.

- If you should forget a carriage return or two (they're needed where you want to fix-format a line), no sweat. The software dips into its handy bag of tricks and plunks them in where you need them.

- After you prepare the text, you can format the output to printer just about any way that turns you on, including right-hand justification (although justification looks strange unless you have a printer with variable horizontal spacing).

My time and cost of writing have dramatically increased, not decreased, by using the machine. Maybe that's not a surprise to you, but it's not what I expected. Nor did I expect the ease of editing after entering the text would vastly improve my feelings about the quality of my writing, and that's what really counts.

Reader Commentary

Brandon Missed Reason Many FM Contracts Fail

By Conrad Weisert

Special to CW

Dick Brandon's views on facilities management (FM), if accurately quoted [CW, Aug. 14], are misleading and surprisingly naive. In claiming that most FM contracts have been failures, Brandon is absolutely right. However, in attributing this sad situation mainly to greedy motives on the managing firm's part, Brandon is ignoring a large body of experience.

Most FM contracts that fail do so for the same reasons internal DP management fails. A contractual relationship just makes it easier to identify the adversaries. Let's look at the reasons.

At the head of the list is, very simply, a lack of competence in DP management. The record of FM firms in recruiting or developing top-notch people is only slightly ahead of that of the user organizations. Indeed, a few years ago it was amusing to note that some of the firms most vigorously selling FM had previously had the worst experiences managing their own DP.

More specifically, many of these firms lacked any understanding of the differences between managing a large installation with comparatively formal standards and procedures and managing a small installation with unwritten, people-dependent traditions. A number of vendors discovered to their surprise

and dismay that it's much harder to run the small installation, particularly with outsiders.

Next is the common absence in FM contracts of realistic, formally stated criteria by which the customer will evaluate the vendor's performance. It's bad enough when a new internal manager assumes responsibility without such a clear understanding, but when a sophisticated vendor that should know better does so, ultimate user dissatisfaction is virtually guaranteed.

All of these problems are often aggravated by the initial internal mess that may have led the user to consider FM in the first place, as well as by zealous marketing people who are confident "details" will work out later.

Contrary to Brandon's assertions, many FM vendors have poured their resources into desperate attempts to salvage a performance crisis, sometimes well beyond any hope of making a profit over the entire term of the contract. We can accuse them of incompetence, carelessness or stupidity, but not a lack of effort.

Brandon probably knows of a number of contract situations in which the vendor was indeed reluctant to expend sufficient effort, but there have surely been at least as many where the vendor made an all-out, though futile effort.

There is nothing wrong with the

(Continued on Page 28)

The Taylor Report

DP Branch's Insulation Mars Quality of Work

By Alan Taylor

Special to CW

One of the sacred cows of computerdom is that information systems employees should report to the top level of the managerial hierarchy. It is not enough to let them report through the controller or production vice-president. The textbooks tell us they should report directly to the top.

However, no one has considered whether the poor quality of much of our software results from this concept of high-level reporting.

I became involved in the question of the Merrill Lynch network after one of the corporation's vice-presidents wrote a lovely article quoting more than 300 foreign-based stocks available in the U.S. This information interested me, so I went to the local branch of Merrill Lynch and asked how the firm obtained and updated data about such global activity. That was when I got my first shock. Merrill Lynch only lists a few Japanese and British stocks — no German, Australian and Dutch ones — although they were quoted in the article.

Well, that made me examine the computer printout rather carefully and ask why the system was using antique conversion rates and if its recommendations were up-to-date. Later, I found the recommendations were not current, but had to go to Tokyo to find out

[CW, Aug. 21, 28].

Naturally, I asked the Merrill Lynch spokesman whether he would report my comments to the DP people, at least the printable parts. Instead, he suggested I write to the company's chairman. He felt sure the chairman would answer my questions, whereas the DP people might fail to cooperate. They were too high on the totem pole to feel accountable to him.

As far as taking computer matters seriously, the Merrill Lynch spokesman had more confidence in the chairman of the board than in the people directly responsible for DP.

Now, if the computer people had been reporting to the controller, I would not have had to go so far up. The Merrill Lynch spokesman could have gone to the controller's department and asked to see that the computer people made accurate printouts. I don't think the spokesman really cared much about the computer flaws; he was more concerned the DPers were reporting independently to the top and insulating themselves from their problems.

Is Insulation Bad?

Even if this is true, the question arises whether DP department insulation is bad. The idea behind it is to "let us get on with the work." But perhaps such insulation

(Continued on Page 28)

Reader Commentary

Canada's Foreign Worker Permits Not New

By I.M. Timonin
Special to CW

I was pleased to see such a well-written explanation of the procedures concerning the issuance of authorizations for temporary employment in Canada ("Canada Curbing All Foreign Labor," CW, May 29).

However, in fairness to readers, I wish to clear up one misconception. The requirement for employment authorizations should not be seen as something new, especially not a new crackdown. Since 1973, individuals who wish to work in Canada have been required to obtain employment visas (the name given

employment authorizations under the old legislation). Employment visas would normally be issued to a worker when it was determined that there were no qualified Canadian citizens or permanent residents available.

A major change is that the new legislation requires foreign workers to apply for employment authorizations at Canadian government offices abroad instead of inside or outside Canada as was previously the case. Although the right of interview will remain with the visa officer, applications can be made in person or through the mails to our visa offices.

I would like to encourage all CW readers who wish to work temporarily in Canada to contact their closest Canadian visa office in order to ensure proper documentation.

Guest speakers who are coming to address conventions or similar gatherings will normally be admitted as visitors. They will not need employment authorizations. This is also the case where highly qualified persons coming to give advice to Canadian companies on such matters as corporate planning and investment whose involvement is in the nature of a speaking engagement or seminar leader rather than

that of a consulting service.

However, we will require employment authorizations for those whose normal occupation is that of training or conducting training courses of a management or development nature.

I trust that this letter will reassure CW readers that there is no new "crackdown" on temporary workers.

Timonin is acting director general with the Recruitment & Selection Branch of the Canadian Employment and Immigration Service.

DP Insulation Affects Work

(Continued from Page 27)

tion encourages inadequate work and results in a deficient message system.

Now, I don't believe when the Merrill Lynch system was budgeted for development and operation that money was allocated for its maintenance. Yet provisions for continuous maintenance funds are just what program users are missing.

If someone had charge of maintenance funds to keep the Merrill Lynch system running properly, then he or she would have been the person to contact, instead of the chairman.

We computer people continue to demand that users be entirely responsible for predicting their own needs. Despite the evidence of decades of faulty systems, we fail to provide for continual user input throughout the use of the program.

As long as communication between users and DPers is inadequate, the current resistance to necessary program correction will continue.

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Brandon Wrong About FM

(Continued from Page 27)

profit motive for a service organization, whether internal or under contract. Indeed, we often counsel managers of ailing DP groups to run their functions "more like a business." Customer satisfaction has always been a strong motivator in any reputable profit-seeking enterprise. Brandon's claim that "an internal organization might be more motivated to provide a higher level of service" is disproved daily in hundreds of organizations.

As a result of well-publicized fiascos and of the minicomputer revolution, FM has lost much of its early appeal. Nevertheless, it can still be attractive to many organizations.

Weisert is president of Information Disciplines, Inc., a Chicago-based management consulting firm specializing in technical and professional standards.

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With Move to Com-Plete Germans Enhance On-Line Operations

By Willi Lewalter
And Willi Werner

Special to CW

WIESBADEN, W. Germany — The State of Hessen, W. Germany, has chosen Com-Plete, the teleprocessing system from Software AG, as the standard for all governmental teleprocessing by the state's agencies.

Each county has a similarly configured IBM 370/158 with 1.5M bytes of memory. Two counties use SVS and three use VS1 operating systems.

In 1976 the board evaluated teleprocessing systems and chose Intercomm from Informatics for

use by each county. The county of Wiesbaden began the conversion of an Inhabitant information system from IBM's Tcam to Intercomm. The conversion took one year. When tested, the converted Inhabitant system was found to be a heavy user of computer resources.

In efforts to operate the Inhabitant application with acceptable response times, batch initiators were stopped and batch work was carried over to additional shifts.

In May 1977, Com-Plete was installed at the Wiesbaden site as part of an evaluation of interac-

tive program development tools. The evaluation also included Roscoe, TSO and a front-end editor called PET from Philips. After an extensive evaluation, the board of directors made a decision to acquire Com-Plete for use as a program development tool in three of the state's installations, including the county of Wiesbaden's facility.

During this same period, the Wiesbaden systems staff began a series of experiments in an attempt to solve the problem of excessive response times in the on-line Inhabitant system. In one controlled test, the staff evolved

dramatic evidence that the then-current teleprocessing monitor itself, in the given environment, was the bottleneck which was causing excessive CPU utilization, high paging rates and high response times.

Because of these problems, the Wiesbaden systems staff asked the state board of directors to allow Wiesbaden to experiment with alternative teleprocessing systems. The board granted resources for a one-man-month effort to create an alternative system under Com-Plete.

Given the short time frame, the systems staff member assigned to the project decided to start with the original Inhabitant system, which was a single-thread version written in Tcam. Using the facilities of Com-Plete, which allow even a nonreentrant batch program to run in a conversational mode, the staff member converted the entire Inhabitant system to run under Com-Plete in four weeks.

The differences in resource utilization were just as dramatic. Paging rates under Intercomm were 25 to 50 a second. Under Com-Plete, the paging rates were reduced to one to 15 a second. Response times previously were 20 to 60 seconds. Under Com-Plete, response times were reduced to one to four seconds.

Lewalter and Werner are managers in the DP center of the county of Wiesbaden, State of Hessen, W. Germany.

Service Reviews MRP Systems

WILLISTON, Vt. — Manufacturers often lose much of the benefit they might gain from an automated material requirements planning (MRP) system because it takes too long to determine what the system should include and how well available packages meet the user's needs.

That, at least, is the argument put forth by a spokesman for Manufacturing Software Systems, Inc. (MSS), that has now published a 250-page book that discusses in detail the various functions an MRP system should encompass.

Although that MRP *Standard System* can be used by itself as either a means of evaluating existing packages or a design guide for those installations creating their own systems, MSS has supplemented that book with a choice of more than a dozen others, each of which reviews the capabilities of existing packages.

By utilizing *Standard System* and the product evaluations, users can cut implementation time from six months or more to 60 days, and evaluation cost from "anywhere up to \$50,000 or \$100,000" to \$1,650 or \$2,150, the spokesman claimed.

The product writeups are based on analyses undertaken by MSS staffers working, as necessary, with the vendor to determine how and how well the package measures up to the functions

described in the *Standard System* book.

They include both factual statements of how the packages work and value judgments when they seem useful, the spokesman said, explaining that if MSS feels for example, a package is unnecessarily cumbersome in the way it handles a function, it would be wrong not to say so.

In addition to analyses of the individual package capabilities, each writeup includes an appendix outlining how the existing code can be customized, either to provide a function not normally available or to optimize the way a function is provided, he said.

The writeups are updated

whenever MSS feels they should be. This includes times when the package vendor issues a new release of the package and when the vendor issues a correction or revision to fix logic that MSS had previously seen as a problem, the spokesman added.

Standard System costs \$650. Each evaluation of a software package — user's choice from among the 16 writeups now available — is \$500, which includes revisions published in the year following purchase. Revisions beyond that time cost \$200/year.

MSS can be reached through P.O. Box 278, Williston, Vt. 05495.

'DCS' Supports More Peripherals

DALLAS — Version 4.3 of the Data Communications system (DCS) from University Computing Co. provides support for IBM's 3890 document processor as well as the previously supported IBM 1419 magnetic ink character recognition (Micr) reader/sorter and the Recognition Equipment Corp. Trace document processor.

Designed to run under almost any IBM 360/370 environment, the updated DCS also supports access to IBM 3614, Diebold and Mosler automated teller machines (ATM), a spokesman

noted.

Compared with other teleprocessing systems, DCS is said to function with reduced region sizes while providing simplicity in coding application programs, as well as security in data entry and resource management. Cobol support, test aids and terminal independence through mapping are also available, according to the spokesman.

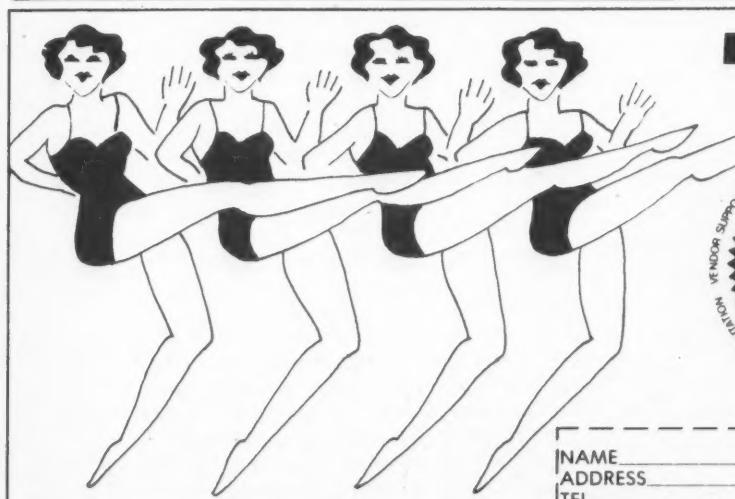
A nondisplay log-on has been added to DCS conventional log-on processing to provide improved security, reducing the possibility of unwarranted entry

into the system. The nondisplay applies to IBM 3270 or compatible terminals, he added.

A Broadcast Master Console Command, also added in Version 4.3, allows a terminal operator to send a message at any time to one or more terminals in the network, the spokesman claimed.

The package runs under DOS/360 and DOS/VS as well as under OS/360 (MFT or MVT) and OS/VS1 and VS2, the spokesman continued. The software costs \$500/mo, he noted from 8303 Elmbrook, P.O. Box 47911, Dallas, Texas 75247.

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Too Many Technicalities?

Perhaps It's Time to Return to File Clerk Role

By Linda J. Hinke

Special to CW

I'd been eyeing the spool of half-inch-wide red cotton tape on my associate's desk for some time. We were working then at the National Archives and Records Service as management analysts, recommending records management programs to other federal government agencies and, on request, analyzing an agency's communications system — its paperwork flow.

As a new member of this group, I was frequently impressed by the sophisticated analytical methods my seniors used both to understand and to recommend changes to an agency's complex

paperwork systems.

The spool of tape continued to fascinate me; it didn't seem to fit into the highly sophisticated world in which we worked. It sat in an honored, uncluttered place on my associate's desk, away from the management information system concept papers, the input forms and the copies of feasibility studies.

Finally, in the usual inquisitive fashion of all systems analysts who have a driving desire to know, I asked, "What is it?"

You know, of course, long before I did at the time. The red cotton half-inch-wide tape was once used to bun-

dle U.S. government papers. The tape on the desk was a remnant of that era.

The red tape had been devised to provide a simple solution to a complex information problem: government workers now had the means to bundle papers in the categories they needed for daily use, for storage and for reference — by tying it all up in red tape.

Since then, of course, we've lost the original reason for the creative solution. The term "red tape" is now used to describe the quagmires of bureaucracy, whether in government or private industry.

Same Purpose

It seems to me that the purpose of the red tape then and of our industry's sophisticated hardware and software now is exactly the same — to help people who want to keep track of their information for easy and current reference, historical perspective, planning strategies and developing new ideas.

People want to use that information to meet the goals or objectives of the organization to which they belong. They want to be able to communicate among themselves and with people in other organizations.

But somehow we've gotten bogged down in the ways and means of manufacturing, using, selling and designing varicolored tape, nylon tape, three-inch-wide tape and self-winding spools. We've lost sight of our purpose as we work on bigger, better, faster Brand Y tape or Brand-D spools.

Our creative concepts and innovative technical inventions have become our "red tape" in both senses — as solutions and as organizational quagmires. Do we ever ask our end users, "Do you need this Yellowtape with a Purpletape combination lock to communicate?"

"What impact do you think this fancy Bluetape machine will have on your ability to find the information you need?"

"What effect does the Orangetape system have on your ability to ask

questions, to answer questions, to talk, to write, to present, to solve problems, to plan?"

"What changes do you think you'll have to make when we install the large Fuciatape machine down the block and the Greentape terminals (with the special Mauvetape line printer option) in your office?"

Do we ever ask ourselves, "What information (data) for you splitting-hair aficionados) are we distributing, networking, data-basing, terminaling, word processing and centrally storing?"

"Is it important that Violettape is too long, too wide, too cumbersome, too easily tangled, doesn't untie well and breaks often — when people need to communicate, to search, to study or to record?"

Simple Solution

What happened to the simple cloth solution wrapped around complex communications among people? Seeing the red tape on the spool moved my imagination into the world of green eye shades, sleeve protectors, high desks, tall stools, inkwells and scratching pens.

Their papers were tied or rolled in red tape and labeled with indexing schemes, categories and data base keys they understood. The batches of information these people needed were readily available a desk away or on the top shelf of their ceiling-to-floor shelves, accessible by a ladder and a nimble young clerk.

Before I receive more mail than I can answer from the truly creative and innovative technicians of our industry, I want to tell you I am encouraged. I'm encouraged about the growth and inventiveness in the microcomputer or personal computer industry. Our organizations are seriously looking at distributed networks, distributed processing, distributed data bases — and distributed information.

These technical breakthroughs and modern concepts serve the same purpose — to return the responsibility and information to the people who use it, need it and are concerned about its accuracy and content.

We've been very skillful at making tape. It's time now to stop making new and fancier versions — we can't implement all its various possibilities now.

We who are the experts of our craft have difficulty deciding whether we need the tape in brown, plastic, on special spools or all strung out end-to-end.

Let's return instead to finding what information our modern tape is wrapped around. Let's become the excellent file clerks we once were — climbing that ladder again and again.

We file clerks can provide a communication service to the people in all our organizations: people who need the information to perform their task as they move toward the goals within each of our organizations.

We have all varieties of tape, the expert knowledge about them, the sleeve protectors, scratchy pens and electronic bookshelves. Are we ready to begin ladder-climbing?

Hinke is an independent information system and management consultant in the Washington, D.C., area.

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GSA's Carr to Keynote Cpeug Meeting in Boston

BOSTON — Frank J. Carr, commissioner of Automated Data and Telecommunications Service (ADTS) under the General Services Administration (GSA), will present the keynote address at the annual meeting of the Computer Performance Evaluation Users Group (Cpeug) here late next month.

Cpeug is primarily a government-oriented organization and attendees are expected to pay special heed to Carr since he is responsible for overseeing the procurement and management of all DP resources by the federal government, according to Cpeug spokeswoman Carol B. Wilson.

The general theme of Cpeug 78 — scheduled for Oct. 24-27 — is efficient management of the DP life cycle. Highlights of the program include a workshop on the future of computer performance evaluation and a special panel discussion of the recommendations of the federal DP reorganization project, Wilson said.

Day-long sessions on capacity man-

agement and on terminal-based system benchmarking using remote terminal emulators will also be major elements of the conference, she added.

Cpeug 78 will be held at the Copley Plaza Hotel, "right in downtown Boston." The registration fee is \$50.

Preregistrations — with checks or money orders made payable to Cpeug — are being handled by the U.S. General Accounting Office branch in Room 1907, Blue Cross/Blue Shield Building, 100 Summer St., Boston, Mass. 02110.

Further information is available from Wilson, Room A-265, Building 225, National Bureau of Standards, Washington, D.C. 20234.

RPG-II Standards Offered

WOODLAND HILLS, Calif. — Free copies of RPG-II programming standards, extracted from a series of training courses, are now available from Info 3, the company that produced the courses.

The document offered includes a basic policy statement on standards, as well as standards for documentation, indicator usage, program identification, control cards and coding conventions for all spec types. A standardized first-page coding sheet for placing identifying comments at the beginning of a program is also described, a spokesman noted.

These standards are part of several references offered with the RPG-II Learning Series of courses, he said.

The four courses in the series are

"Introduction to RPG-II Programming," "Disk Processing," "Advanced Programming Techniques" and "Auto Report."

The introductory course, including a manual and audiocassette, costs \$125, as does the "Advanced Programming Techniques" course. The "Disk Processing" course costs \$245 while the "Auto Report" course, which is limited to the IBM feature of the same name, costs \$50.

The entire series can be purchased at one time for \$545.

Both the courses and the free RPG-II standards documents can be obtained from Info 3, Suite 193, 21241 Ventura Blvd., Woodland Hills, Calif. 91364.

Package Tunes DOS Systems

COLUMBUS, Ohio — The Explore-Discover package just announced by Goal Systems Corp. is a two-part performance monitor and operator aid for IBM DOS/VS users.

Explore provides on-line information through which the environment can be controlled dynamically; Discover accumulates disk I/O activity counts for later analysis and system tuning, if required, a spokesman explained.

Explore produces five on-line reports showing: data the spokesman labeled Kiviat variables; partition and job-related data; channel activity; paging activity and usage; and critical resource usage.

The so-called Kiviat variables include measurements of CPU active state, CPU and channel overlap, any channel busy, problem state, CPU only, channel only, CPU wait state and supervisor state.

Explore also includes a missing-interrupt feature which prompts the operator whenever an intervention requiring attention remains uncorrected.

The reports can show either current or cumulative data.

The disk I/O activity logged by the Discover subsystem includes seek activity by cylinder within file name, average seek to cylinder, number of arm movements, total start I/Os and a "unique non-linear motion factor," the spokesman continued.

Explore can be leased for \$800/yr or \$2,400 for a three-year lease after which use of the software is free. The Explore-Discover combination costs \$1,200/yr or \$3,600.

Goal can be reached through P.O. Box 29841, Columbus, Ohio 43229.

Correction

In "Search for Accuracy Shows CPU's Limitation" [CW, Aug. 21], the parenthetical exponents in the mathematical expressions below the subhead "Real' Numbers" should have been (-4) rather than the $(1/4)$ as printed.



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DPers Urged to Get Involved in Company

By Gary Ward

Special to CW

Data processing . . . In many companies, it's thought of as a necessary evil. The computer is there, but it gets utilized only when necessary.

The other departments in a company often tend to think of the DP department as somewhat of a service bureau — personnel not actually part of the corporate family. If you find this attitude in your company, perhaps it's time to reevaluate your DP procedures for project requests.

DP is too sophisticated, too expensive to let this type of attitude prevail.

In many cases, a system is designed for an individual user or department. However, with a little long-range planning and communication with the ana-

lysts responsible for a project, the system can be useful not just to one area, but to many areas.

If the analysts and end users are communicating properly, they can design the system to handle future requirements as well as immediate needs. Such a design would eliminate reprogramming or the complete redesign of a system in the near future, thereby giving the end users the information they need both now and later.

Several theories about eliminating analogous requests have been developed and discussed throughout the DP industry. Various approaches (top-down design, structured walk-throughs/structured programming, vertical design) all have merit and all work toward eliminating the problems

of redesign and reprogramming, but the problems continue.

The problems are still around mainly because the user requesting the project does not fully understand the impact of his request. He has an immediate need and the specifications he has laid out solve his particular problem, but they don't address the other problems or needs relating to his request.

By the time the DP area gets involved, the specifications are written and, in more cases than not, a deadline has been set. The analyst then has no time to look into the ramifications that may be caused by this request.

He also has no time to look into by-products, such as management reports or the possibility of designing the system to serve more than one user.

All the analyst can do is get the specs and code. And the circle keeps going around and around. Change the specs and reprogram.

Stress DP Involvement

The DP community has consistently stressed user involvement. Perhaps the approach should be reversed. The corporation itself should stress DP involvement.

The DP personnel know the data, the data attributes and how the data can best be used. Logically, the involvement of DP personnel in the early stages of project design would help the user isolate his needs in relation to the needs of other departments or areas within the corporation.

This involvement could lead to such benefits as a small programming effort to "hook" the user to an existing system or a simple routing of existing reports to the new user.

Design and programming cost money, and there is no need to reinvent the wheel for every job. Get the DP department personnel involved with the corporate business.

Ward is a system aid marketing representative with University Computing Co. in Dallas.

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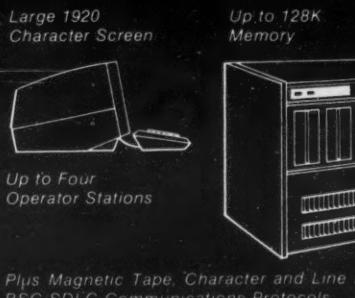
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With Comm-Pro Software

IBM 3705 Gains NCP-PEP Switching

By Ronald A. Frank
CW Staff

MANHATTAN BEACH, Calif. — Comm-Pro Associates has introduced a software package that reportedly lets users of IBM 3705 front ends switch start/stop terminals between Network Control Program (NCP) applications and Partitioned Emulator Program (PEP) applications.

Called the Virtual Line Switch (VLSW), the package allows terminals to be switched between both types of applications on a single-line facility; formerly, each application had to run on a separate line, a Comm-Pro spokesman said.

The VLSW software works in conjunction with Comm-Pro's earlier Network Facilities Package, which permits users to switch a line between different Emulator Program (EP) applications. VLSW extends that capa-

bility one step further into NCP applications, effectively providing a bridge between EP and NCP communications systems, the spokesman explained.

Speed Select Feature

The VLSW software includes a speed select feature so a line can be shared between ASCII teletypewriters and IBM 2741 terminals. This permits both types of terminals to be handled through a single telephone rotary group, Comm-Pro noted.

After a phone connection is made, an operator can enter one character to set the device type and speed of the line and a second character to select an NCP or EP host application. As an example, a user might select Virtual Storage Personal Computing (VSPC) through NCP or the Time Sharing Option (TSO) through EP.

Host applications and the identification characters that select them are defined during PEP system generation. Since dedicated line interfaces are not required, the number of lines and modems can be reduced without limiting CPU availability, the company said.

The speed select feature is similar to the IBM Multiple Terminal Access (MTA) which runs under NCP, but MTA is complex and not supported under a number of Vtam applications, the spokesman noted.

By using the VLSW package, the user can avoid potential problems with the MTA software, Comm-Pro claimed. A basic VLSW package requires 5,400 bytes of 3705 storage.

The VLSW software acts as a "front end" to both the NCP and EP programs and will switch to the appropriate application program. (Continued on Page 34)

Bankwire II Moving Heavy Funds Traffic

By Brad Schultz
CW Staff

NEW YORK — Bankwire II, the latest version of the banking industry-owned domestic electronic funds transfer (EFT) system, has begun serving 186 subscribing commercial banks by handling 18,000 to 20,000 transactions on a typical day.

Supported by 248 terminals, Bankwire II can reportedly work at full message volume capacity 30 times faster than its predecessor.

News on Nets?

A special report on data communications networks will be part of the Nov. 27 issue. Suggestions on topics to be covered as well as articles relating user experiences — good or bad — with virtually any type of network — private-line or dial-up, packet-switched or conventional transmission — will be welcome.

Contributions should be about five typewritten, double-spaced pages. Photographs, charts or other artwork are appropriate.

Letters and articles, or questions about story ideas, should reach Ron Frank, Computerworld, 797 Washington St., Newton, Mass. 02160 by Sept. 29.

Bankwire I. That capacity — 60,000 messages per day — is three times Bankwire I's maximum load, according to the Bankwire organization.

Typically handling daily transactions worth more than \$20 billion, the private-line network includes two computerized message-switching centers located in Jersey City, N.J., and Dallas that feature hardware made by the Collins Communications Switch Systems Division of Rockwell International.

The Jersey City facility that features redundant Rockwell Collins C8562 mainframes is now functioning, whereas the Dallas center will not commence operation until December, a Bankwire source said.

The Dallas facility will also employ redundant C8562 processors, and both centers will share the same data so either can provide total network service if necessary, the source explained. Six disk file units will store this duplicate data at each center.

Terminal Types

Bankwire II employs programmable channel termination groups (PCTG) as remote concentrators attached to 48 communications lines. Each is arranged in a redundant configuration with alternate paths to the switching centers.

The PCTGs handle user terminals with op-

erating speeds ranging from 100- to 2,400 bit/sec. Intercity trunking occurs at 4,800 bit/sec, and the switching centers are directly connected via 9,600 bit/sec links.

Western Union Data Services has supplied nearly 200 Banknet/1 and Banknet/2 terminal stations with terminal controllers programmed for the Bell System 8B1 protocol. Each controller handles a variety of terminal arrangements, the Bankwire source said, as well as the traffic to and from each C8562 system.

Each controller features 4K words of memory and is driven by a Scientific Micro Systems, Inc. SMS-300 microprocessor executing instructions in 300 nsec cycles. The Bell 8B1 protocol allows the C8562 to poll all the terminals in a sequence or on a selective basis.

A Western Union Data Services spokesman said three arrangements of 100 bit/sec Banknet/1 terminals are employed by the network: the EDT 33 automatic send/receive (ASR), EDT 33 receive-only (RO) and EDT 33 ASR with EDT 33 RO.

Similarly, there are three arrangements of 300 bit/sec Banknet/2 terminals: the EDT 300 ASR, EDT 300 RO and EDT 300 ASR with EDT 300 RO.

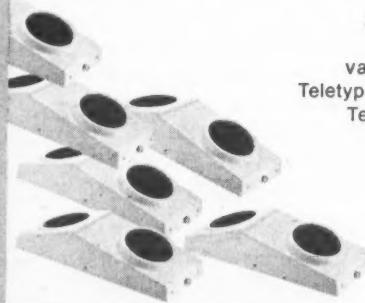
Honeywell, Inc.'s Incoterm subsidiary supplied the intelligent Banknet/3 and 4 terminals. (Continued on Page 34)

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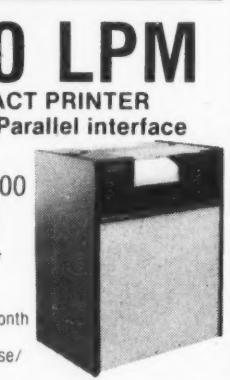


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Report Eyes AT&T Policy, Trends

MILLBURN, N.J. — "While lip service is being paid to the 'digital future' in many quarters of the communications industry, a number of recent AT&T developments and policies will make realization of an integrated digital network more difficult."

Probe Research, Inc. drew that conclusion in "The Digital Future of the Telephone Network," a 144-page study now available.

The Probe study details AT&T policies and canvasses the "conflicting impacts" of such recent Bell developments as Electronic Switching System No. 4, CCIS, Subscriber Loop Carrier systems, Loop Switching Systems and Dimension with ETS.

Also assessed is progress toward "a truly digital [communications] system," including Bell's Advanced Communications Service.

The report explains how analog switching and transmission technology has evolved and how it interacts with digital technology, a Probe spokesman said. The obstacles to an all-digital network as well as some proposed solutions are also discussed, he added.

The report costs \$150. Probe can be reached at P.O. Box 251, Millburn, N.J. 07041.

NCP-PEP Switch Added to IBM 3705

(Continued from Page 33)
gram based on a request from the terminal operator.

Sysgen Definition

In order to accommodate the VLSW capability, channels into NCP are defined at 3705 Sysgen time as "virtual" lines via specification of the TYPE=NCPVIRT parameter on the GROUP or LINE macro. Virtual lines provide paths into NCP/host applications in much the same way as subchannels do for EP/host applications.

Virtual lines appear to NCP as normal switched lines, but they do not have real hardware interfaces. A virtual line is made available for host communication when the NCP decodes a host Contact command (analogous to Enable CCW).

Command Recorded

Since a virtual line does not have a real hardware interface, the Contact command is simply recorded to flag the virtual line as available, the company said.

Net Moving Heavy Traffic

(Continued from Page 33)
nals, identified as SPD 10/25 stand-alone CRTs and SPD 20/20 clustered CRTs, respectively.

In addition, the network supports a "wide variety" of CPUs used as terminals. More than 15 computer systems are currently employed under this fifth category, reflecting the configurations peculiar to Bankwire's member banks and representing the major mainframe vendors, the organization source explained.

message to other member terminals.

A "special interconnection feature" is expected to then allow routing of the network's traffic through either TWX or Telex, the source noted. A "group addressing feature" and an "extended broadcast message feature" will permit individual members to send a single message simultaneously to multiple addresses, he added.

Message Accuracy

"The single most important element beyond prompt message delivery is message accuracy," the Bankwire organization stated. "This is especially true in a payments system in which single messages involve funds transfers of millions of dollars."

In order to provide accuracy and accountability, Bankwire II messages conform to a predefined format so every message has the proper information prior to system entry.

Further, the switching center acknowledges receipt of every message entered as a means of avoiding message loss en route from sender to the center. The ultimate receiver of every message (a bank) acknowledges each receipt to preclude message loss between the switching center and receiver.

In addition, every message is numbered upon entry, the Bankwire source said, and an output sequence number is assigned to each message received, creating a hard-copy audit trail for every terminal every day.

At each day's end, all member banks receive a transaction journal of all funds transfers, an "undelivered message report" and an account of each terminal's activity — measures designed to further the accountability of payment messages.

When the Dallas switching center starts operation, Bankwire will incorporate a batch transmission facility allowing members to send data files of up to 10,000 records as a single batch

System selection is accomplished by grouping NCP virtual lines and EP subchannels into pools according to the host system that will control them (e.g., VSPC under NCP, APL under EP). A unique ID character is then associated with each resulting pool.

Operator Role

The terminal operator selects a system simply by entering the ID character of the associated pool immediately after telephone connection is established. An appropriate message, specified at Sysgen time, will be returned to the terminal in the event a connection cannot be made with a pool element (all are unavailable).

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Both packages are available for a 30-day free trial period, Comm-Pro said from Suite 700, 638 14th St., Manhattan Beach, Calif. 90266.

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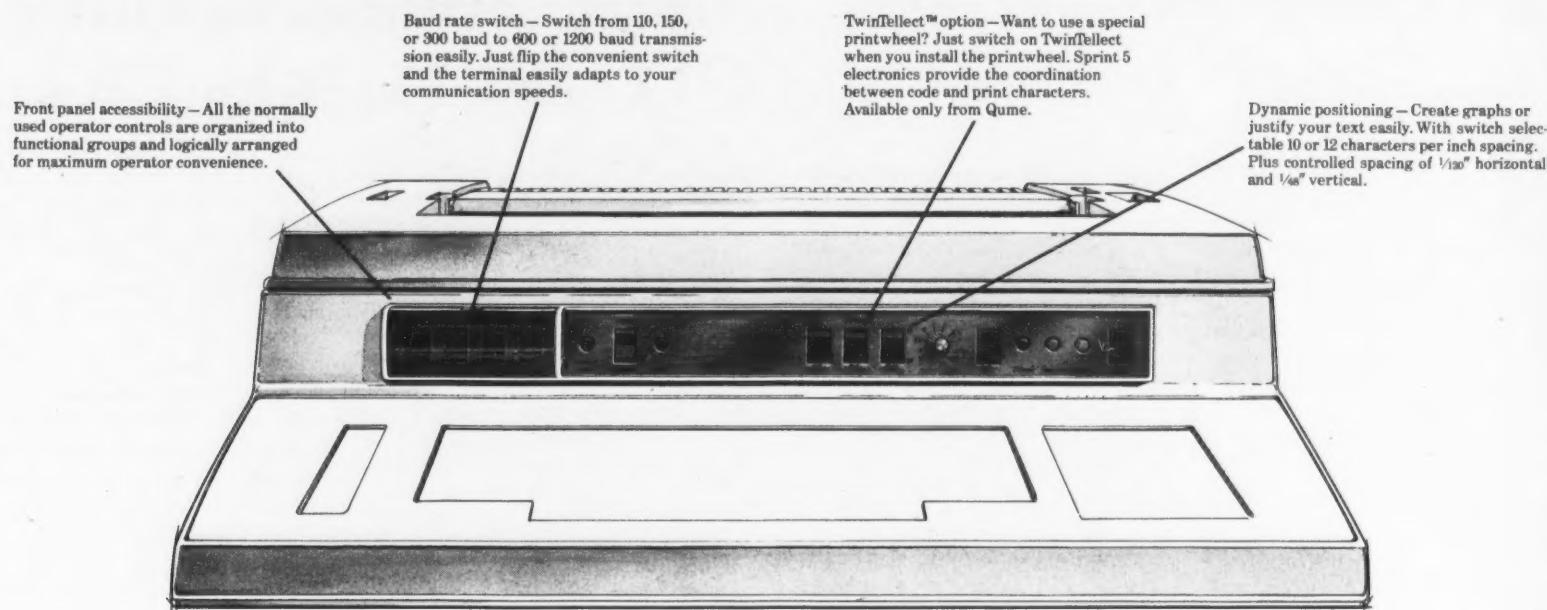
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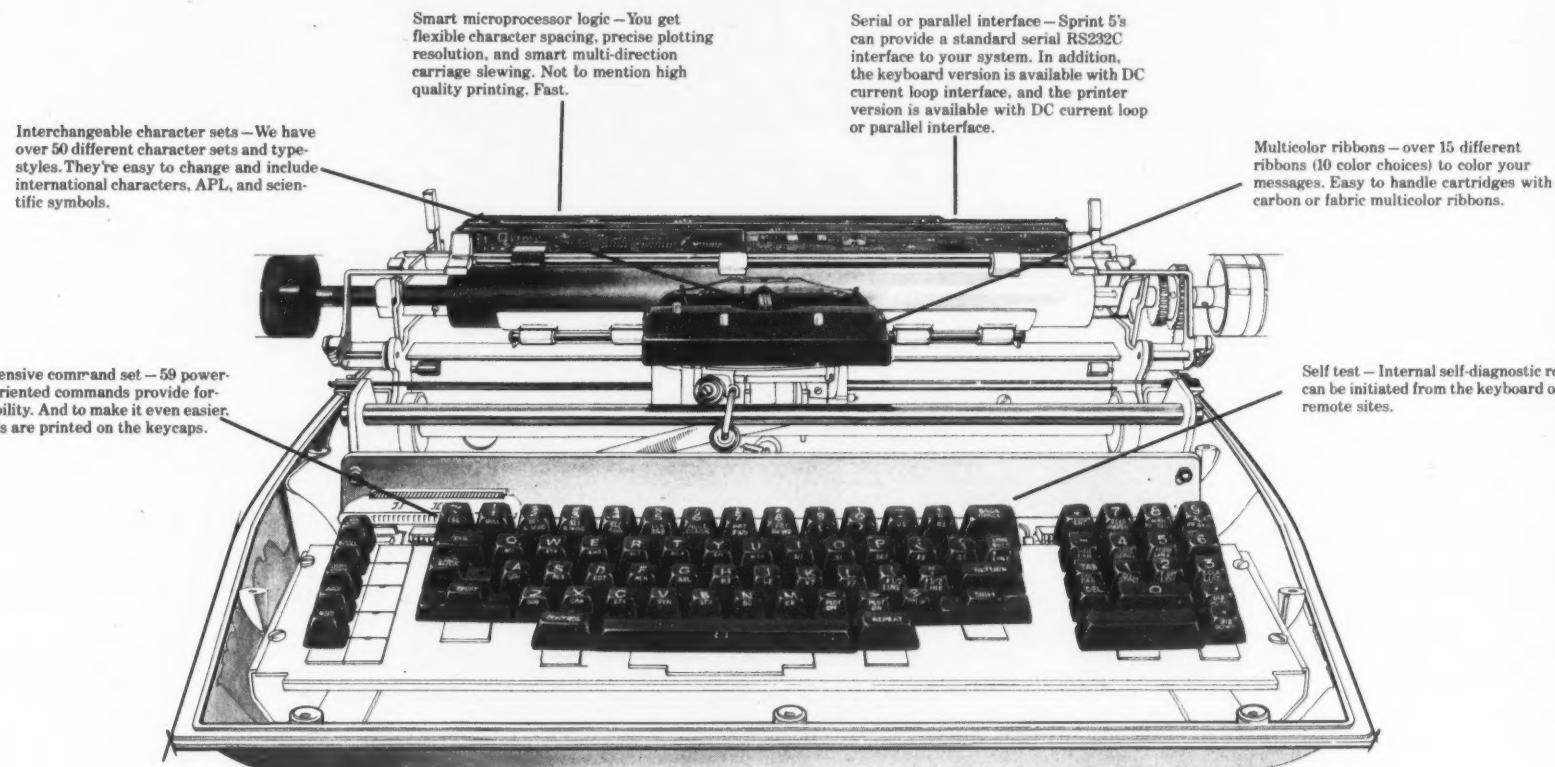
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Qume
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CPU/Operator Interface Operated by Touch

MOUNTAIN VIEW, Calif. — A general-purpose I/O device, designed to provide communications between an operator and a CPU in situations where only a limited dialogue is required, has been introduced by Control Technology and Engineering Corp.

The C-Pad is a microprocessor-based, touch- (capacitance-) operated device containing four rows of five switches, with eight alphanumeric LEDs beneath each switch. The host-controlled LEDs are used to guide a remote operator through a dialogue, a spokesman explained, and can be grouped together (again under control of the host computer) to provide 40 characters of data readout or operator instruction prompting.

The device, which has an RS-232 interface can be used as a limited "keyboard"-type unit in situations

in which an operator must respond with one choice out of a maximum of 20, the spokesman continued. With suitable programming, the device can also be used to initiate "menu" displays; that is, a response by the operator would bring up a list of several choices, in which each key has a different meaning, depending on which menu is in use.

The C-Pad, expandable to 32 switches, can be rack-mounted or used on a desk, the spokesman said, and the character set available with the unit includes 64 ASCII characters, as well as control codes. Data rate is selectable at 9,600-, 4,800-, 2,400- or 1,200 bit/sec.

The C-Pad sells for \$1,950 in single-unit quantities, or \$1,850 in quantities of more than 100, from the company at 348 E. Middlefield Road, Mountain View, Calif. 94030.

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Smart Terminal Features DEC LSI-11, 9-In. CRT

WALTHAM, Mass. — The Computer Marketing, Inc. QB-11 intelligent terminal employs the Digital Equipment Corp. LSI-11 microprocessor and features a 9-in. CRT with 64-by-16 or 80-by-24 displayable characters and a full ASCII, programmable read-only memory-based keyboard.

The QB-11 also features 15 user-specified function key legends, dual key pads for user adaptation, an 18-slot Q bus chassis, a line time clock, remote switched ac power for up to four peripherals, keylock control of operator interrupt and modular expandability, the firm said.

The 7 by 9 dot matrix CRT is supported by a full underline character cursor and character-by-character or full-screen inversion capability, the firm noted. The RS-232C interface is standard, while the 20 mil CL interface is optional. Data transmission is from 110- to 9,600 bit/sec.

Full- or half-duplex, synchronous or asynchronous modes are available, the firm said, adding that the standard and floppy disk versions of the QB-11 weigh 45 lb and 25 lb.

Computer Marketing has also announced its MB-80 intelligent terminal based on Intel Corp.'s SBC 80 microprocessor. Aside from having a different micro and chassis, this terminal offers the same features as the QB-11.

Both devices offer refresh rates of 50 and 60 Hz and accept input power of 115V or 230V ac at a maximum of 7A. A battery-driven backup power unit is optional.

The various versions of the QB-11 cost \$3,950 to \$9,425 in single quantities and \$2,085 to \$8,950 in quantities of two to nine. The MB-80 costs \$2,510 to \$2,940 and \$2,085 to \$2,795, respectively, the firm said from 257 Crescent St., Waltham, Mass. 02154.

Portable Terminal Suits Time-Sharing Mini Uses

MOUNTAIN LAKES, N.J. — A portable data terminal for communications with time-sharing and minicomputer-based systems has been introduced by Data Access Systems, Inc.

The firm's DASI 744 is a modified Texas Instruments, Inc. Model 743 terminal, enhanced with switch-selectable parity, RS-232 interface and cable, answer mode and acoustic coupler.

Increased Flexibility

The DASI 744 offers greater user flexibility, a Data Access source claimed, explaining that the switch-selectable parity, for example, enables users to communicate with any number of time-sharing services, while the RS-232 interface and cable allow direct hook-up to minicomputers as well as

remote access through the acoustic coupler.

The DASI 744 comes with a carrying case and features operator-selectable printing speeds of 10- and 30 char./sec, the source added, noting that "undesirable noises" associated with impact printing are eliminated by the terminal's solid state print head, which develops characters on thermal sensitive paper.

Free Warranty

The terminal is backed by a "free 90-day on-site warranty" with service by Data Access technicians. After 90 days from installation, a maintenance contract is available.

The DASI 744 costs \$1,595, the firm said from 100 Route 46, Mountain Lakes, N.J. 07046.

Smart Terminal Offers Editing

SANTA ANA, Calif. — Televideo, Inc.'s TVI-912 intelligent terminal features an editing capability, protected field, addressable cursor and microprocessor-based control.

Reportedly compatible with all computer systems, the terminal offers a 2,000-char. additional second page memory, a printer port, line and character insert/delete, upper and lower case characters and tabbing. Transmission rates are switchable from 75 bit/sec to 19.2K bit/sec.

'Less IC'

The TVI-912 uses less than one-third the number of integrated circuit components of comparable terminals, according to a Televideo spokesman.

No cooling fan is required, the source said, adding that each terminal is subjected to more than 72 hours of burn-in testing before shipping.

The TVI-912 costs \$749 with quantity discounts available, the firm noted from 3190 Coronado Drive, Santa Clara, Calif. 95051.

With Individualized Services

Two Counties, One College Sharing DP

Special to CW

FONDA, N.Y. — Although Robert Frost wrote "fences make good neighbors," the Fulton-Montgomery Data Processing Service Center here is an example of how two neighbors can cooperate in a DP venture, save money in the process and still individualize the service.

Fulton and Montgomery are two rural counties in upstate New York, each with a population of about 55,000 people. By pooling their resources with Fulton County Community College here, the counties and

the college have created a DP center with an annual budget of \$370,000. Separate DP centers would have cost the three an estimated \$600,000.

But the budget for the center was only one consideration; another was staffing the center. Since only a limited number of competent people are willing to settle in rural areas for the salaries the center can afford, the predominantly agricultural counties and the college anticipated difficulty staffing three installations.

As a result, the center trains most of its own staff, including the senior programmer who had never seen a computer before beginning work there in 1970.

Like Two Families

Although the two counties share a Univac 90/30 mainframe, they continue to run their businesses independently, much like two families living next door to each other. These separate identities are reflected in the computer jobs they run.

For example, Fulton County uses a purchase order system and encumbers accounts. Montgomery County, by contrast, allows each department to do its own purchasing and has no uniform system.

Another example is in payroll processing. Montgomery County processes 17 different payrolls every two weeks for 395 county employees. But Fulton County, with the same number of employees, draws a single payroll every two weeks.

Before the center was established in 1977, Fulton County used bookkeeping machines and Montgomery had a small computer system; the college had installed the 90/30 system a year earlier. Talk of a shared computer center began in 1971, a year after Montgomery set up its small-scale DP facility.

However, the plan got nowhere until 1976, when Fulton County asked Montgomery to process work for the Board of Elections. Subsequently, Fulton faced the prospect of expanding its office staff or going into DP

(Continued on Page 38)

Adding Tasks Proves Snap At Camera Maker

Special to CW

RAMSEY, N.J. — An add-on memory is improving the picture at Minolta Corp. when it comes to productivity of the firm's computer system.

The 512K-byte Memorex Corp. 6400 memory system has allowed the company to add many applications to its IBM 370/135, according to Albert Paul, DP manager here at the U.S. distribution headquarters of the Japan-based camera manufacturer.

"We are getting more out of our existing mainframe with the additional main memory. It now handles both Customer Information Control System [CICS] and Entry Time-Sharing System [ETSS] applications," Paul said.

"We had the ETSS on the system before upgrading the memory, but with the addition of CICS applications, the paging rate was getting excessive. The additional memory eliminated the thrashing and greatly improved the response time from the CRTs."

The Minolta DP facility has experienced a great deal of change within the last few years. For a long time, a 360/20 carried the load until it was replaced, briefly, by a 370/115 Model 2. With continual company growth and a more extensive use of data processing, the company traded up to the current 135 system, adding the Me-

(Continued on Page 39)

FM Operation Mixes Vendors, Gains Time, Money Savings

By a CW Staff Writer

PITTSBURGH, Pa. — What do you get when you combine two hardware vendors to produce a DP operation? What the Forbes Health System here got was added flexibility in its reports, a decrease of 17 days in the average amount of time between billing and receipt of payment and a reduction in the amount of time hospital personnel must spend entering and retrieving information.

Forbes is a corporation that runs two hospitals with a total of 530 beds; it is preparing to open a third unit. Before its present system was installed in 1976, it had participated in a cooperative DP effort with other area hospitals, sharing computer facilities. However, it felt the services it received were neither timely nor flexible enough to meet its needs.

To remedy this situation, Forbes sought the advice of Compucare, Inc., a consulting and facilities management (FM) company. Since Forbes did not wish to start its own DP department, Compucare recommended the FM approach, selecting a Burroughs Corp. B3830 system for financial applications and

a Data General Corp. Eclipse C/330 for an on-line patient admission system.

One of the reasons for choosing this approach was the cost, according to Jack Frank, a spokesman for Forbes. Forbes is very cost-conscious, he explained.

"Right now, the system is not saving us money because of the initial outlay of funds for equipment and so on. But over the long term, the savings will be substantial, especially as we continue to bring new things online, such as our mailing list, our internal communications list and other functions that we're doing now with outside services," he added.

The Burroughs system, working around the clock with the Master Control Program, 250K bytes of memory, 350M bytes of disk storage, a 750 line/min printer and CRTs for data entry, runs all the financial applications for Forbes. These include payroll/personnel system, an accounts payable system and a general ledger system.

The equipment, located at Columbia

(Continued on Page 40)

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Two Counties, College Pool DP Resources

(Continued from Page 37)
on a larger scale.

However, Fulton would have required an additional 30 people to duplicate the work manually, at a cost of nearly \$400,000/year — if the office space could have been found for them.

Firms Offer Free Booklets

Several vendors are offering free booklets describing subjects of interest to DPers.

- Datatrol, Inc. is offering a brochure describing its Datatrol RS6100 retail POS system. Designed to monitor, record, process and control merchandise and sales information at the department, class and SKU (stock-keeping units) level, the system is comprised of three components: the company's IDT-6000 POS terminal, the SLC-6100 store level controller and the Central POS system.

Copies of the booklet are available from the company at Kane Industrial Drive, Hudson, Mass. 01749.

Static Electricity

- A semitechnical discussion of the causes, effects and remedies for static electricity appears in a booklet available from Static, Inc., a manufacturer of static neutralizing equipment. The firm can be reached through P.O. Box 414, Lee, Mass. 01238.

- "Uniplex: High-Speed Remote Multiplexing for Process Control" discusses a system that makes maximum use of cable with time-sharing techniques that let one twin-ax cable handle as many signals as are ordinarily carried by thousands of cables, according to the company. The booklet also includes a description of the capabilities of remote multiplexing and the benefits of the product sold by I/C Engineering, a unit of the Anaconda Co.'s Wire and Cable Division located at Dept. A, Greenwich Office Park III, Greenwich, Conn. 06830.

To meet this problem, the two counties' boards of supervisors set up a six-man Board of Advisors — three members from each county — to oversee the management of the DP center. One of the board's first decisions was to move the 90/30 CPU out of the college and into the center, an unoccupied elementary school building six miles away.

The only expenses associated with this move were the

movement of the computer itself and the air conditioner needed to cool the center. The system was moved over a long weekend. The computer was shut down at 5 p.m. on a Thursday night and was back in business at 8 a.m. the following Monday.

Operating with a staff of 17, the center prepares real estate bills for two cities, sewer and water bills for one city and statistical reports for four

nursing departments. In addition, the center handles student jobs for the college. From June through December of last year, it handled 27,500 jobs for the college, including 8,000 student projects.

The Social Services Department, with 1,100 clients in Montgomery County alone, is the biggest customer of the data center, taking up 60% of the center's workload. The services provided include ad-

ministration, food stamps and maintenance of medical assistance records.

Management of the joint center feels that it has proven a point — that two counties can successfully join in the operation and utilization of a single computer center and still be good neighbors.

As a result, the center plans to duplicate for Fulton County what it has done for Montgomery.

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Tally Units Get Options

KENT, Wash. — Two printer attachments introduced by Tally Corp. provide features expected to be useful to medium-scale printer users.

The cover uses "flexure technology" that is impervious to wear or mechanical failure, he claimed.

The other attachment introduced by the company is a special paper-handling assembly that lets the operator remove a form from the printer immediately above the print head. It was specifically designed for checkout-counter types of applications where a customer is waiting for the processing of an invoice.

The Hush-Tone cover costs \$300 and the paper-handling assembly sells for \$195 from Tally at 8301 S. 180th St., Kent, Wash. 98031.

Kidde System Monitors Buildings

PAWCATUCK, Conn. — A computer-based system for the detection, control and prevention of crisis situations in buildings has been introduced by the Douglas Randall Division of Walter Kidde & Co., Inc.

Key elements of the Kidde KDS system are a microprocessor, CRT, printer, floppy disk and data collection devices that provide surveillance of the locations to be monitored, as well as passage

through controlled points. Unusual or critical events are displayed on the CRT and automatically logged on the printer. The system can be programmed to respond automatically to the signals received from the sensors, which operate over phone lines and detect heat, smoke, entry, low pressure and other events.

Prices for the system, which begin at \$40,000, depend on the complexity and number of

tasks assigned to the system, a spokesman said from 6 Pawcatuck Ave., Pawcatuck, Conn. 06281.

Add-On Aids Minolta Jobs

(Continued from Page 37) morex unit about one year later.

"Selection of the Memorex unit was based on delivery, service and economics," Paul said. "It could deliver the unit in 30 days, and the price-performance of the unit was excellent."

"We finally chose Memorex because we felt it could provide the maintenance support we demanded of any independent vendor. Let's face it, you can have the best box, but if you can't fix it because of an inadequate organization, it's just no good."

The CICS applications that began overloading the prior configuration are now in operation and include accounts receivable, order entry and inventory systems. The ETSS permits the on-line development and testing of programs. According to Paul, this has led to a doubling of productivity for programmers.

The Minolta mainframe has five partitions — a Power spooler package, a CICS package, an ETSS package, a batch production ETSS partition and background, where compiles and tests are performed.

Other hardware includes four tape drives and eight disk drives with capacity for almost 1G bytes.

Twenty-two Memorex 1377 CRT stations are used to perform the program development, accounts receivable and order entry functions. Order entry has an interactive process in which customer credit checks are made.

The system then updates the inventory and picking and packaging documents are printed in the warehouse.

If your business depends on the flow of information between locations, TI's new Series 700 Distributed Processing Systems can lower your costs and increase your profitability.

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FM User Mixes Vendors, Saves Time, Money

(Continued from Page 37)

Health Center in Pittsburgh, one of the hospitals run by Forbes, also runs a patient accounting system called BHAS-2, which was obtained from Burroughs and modified to meet Forbes' needs more precisely.

The Eclipse C/330, running on-line at East Suburban Health Center in a nearby suburb, includes 256K bytes of memory, three 92K-byte disk drives, a tape drive and communications capabilities for up to 256 lines.

At present, 17 terminals and seven printers are attached to the DG unit. Installation of terminals at Columbia to extend the patient admission system to that hospital is under way.

Hospital officials feel a direct link between the two systems is unnecessary

and not worth the expense of a phone line. As a result, information is exchanged between the two systems every night via magnetic tape.

Difficult Shakedown

Although it took approximately three to four months to completely shake down the Burroughs hardware, it has performed admirably since then, according to Guy Hess, director of information systems for Compucare.

"Initially, we had a lot of problems with the hardware — it just wasn't functional. My feeling is that this is the same problem that occurs with any computer — it just takes X amount of time to 'seat in' and, once that happens, you don't have any problems for two or three years after that."

An ideal way to deal with this problem, he feels, would be to just install the equipment and let it work out its problems for this period, although he recognized this is usually not possible in fact.

Patient contact with the two systems begins before the patient is admitted. "As much as possible, patients are scheduled in advance. The base information is entered, such as name, address, expected date of admission and so on.

"A day or two before the patient is admitted, he is called by the hospital and we do a 'preadmission' routine. That way, if the admission process occurs the way it's supposed to, it takes about two or three minutes for him to actually be admitted and the only thing

necessary is verification."

Efficient Method

"The system has added a great convenience as far as patients are concerned," according to Frank. "If a patient must return to the hospital, you don't have to go through all those lengthy questions everybody complains about — you simply tell the system your name and whether you've been to the hospital before, and all the information comes right out on the tube. So it's a real time-saver, which is of course a money saver."

Two Expansion Routes

This is just the beginning of its involvement in DP, Forbes feels. In the future, it plans to extend its services in two distinct ways.

One of these will be the addition of other hospital services to the system, such as an on-line pharmacy system, physician order communication and an on-line laboratory system in which lab instruments will relay their findings directly into the computer.

Selling to Others

Secondly, Forbes plans to extend the service to other area hospitals. "Right now, a smaller hospital in the Pittsburgh-tristate area doesn't really have the facilities or the money to come in with its own computer system. However, this system was planned with extra capacity in mind, so it could buy into ours," Frank said.

"That's another possibility for cost savings, not only for us but for the health care industry in general," he added.

Collator Handles Aperture Cards As Well as Tab

MORRISTOWN, N.J. — A sorter/collator from Keuffel & Esser Co. can collate and separate aperture card sets at a rate of 380 card/min., according to the company.

The unit can be programmed to collate any number of sets and to insert separator cards between sets, a spokesman noted.

No Special Installation

The device, which the company claimed is the only one on the market specifically designed to handle standard tab cards as well as aperture cards, can be operated on any standard-sized desk or table and requires no special installation.

The sorter/collator sells for \$13,877 from the company at 20 Whippoorwill Road, Morristown, N.J. 07960.

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11 NEW—Distributed Systems: Are They Right for You? Instructor: Gary Audin	Sept. 25-27	Oct. 18-20	Nov. 15-17	Dec. 6-8	LA Dec. 13-15
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Evolution of Systems Design at Duriron Co., Inc.	Description of TOTAL 8.0 Facilities	How To Read A Person Like A Book	Technical Considerations For A Successful First Year	Human Considerations For On-Line Systems Design	Why Do Most DP Projects Run Over Budget	Distributed Processing in an On-Line Real Time Environment	DBA—Tech Support or Spearhead of Development	Concepts of Structured COBOL
TOTAL in a CPA Firm—S.D. Leidesdorf	Natalus North American Tariff Look Up System	The Art of Negotiation (Part 1)	Flexibility in Financial Statement Preparation	The Concepts Of Meta-Talk	TOTAL Batch Software Exchange	Data Base Administration—Defining the Role	Concepts For On-Line System Design	Preparing for the Unknown
Testing in an Online Environment	Auditing and Control—A Data Processing View	Federal User Special Interest Group	Ledger Manufacturing Systems in Transition	On-Line Inventory Recording for System 3	Variable File Performance Considerations	System 3 Special Interest Group		

Cincom Systems Knock-About first formed in 1970 by Cincom and its client user group has truly become the premier forum for the exchange of information between successful implementors of data base/data communications systems.

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Team Approach Aids Navy DP Audit Activity

By Oliver W. Parson

Special to CW

DP within the U.S. Navy, because of its diversified and sometimes specialized nature, requires that auditing techniques be just as particular. Following is the first of a two-part series on how the Naval Audit Service handles its responsibilities in the DP environment.

WASHINGTON, D.C. — Navy DP is big business and absolute dollar values as well as rapid growth rates mandate that the Navy conduct objective, independent evaluations of major DP systems.

Basically, those people involved with the DP auditing function are engaged in several types of activities. These include developing the in-house tools to

accomplish the audit, participating in audit activities and supplying accurate systems development advice. However, to effectively pursue audit activities, the Naval Audit Service, which has the job of overseeing all of the Navy's computer systems and operations, approaches its task through several distinct departments or branches.

Data retrieval programs and technical guidance for conducting and utilizing computerized audit techniques are provided by the EDP Audit System Division Headquarters. This particular branch maintains a state-of-the-art knowledge of current DP techniques and operations and can effectively communicate that knowledge to the computer specialists and auditors in the field.

The Audit System Division also sponsors several in-house training courses throughout the year.

Evaluating the efficiency of DP installations and operations is the primary concern of a second division — the EDP Management Audit Branch. This group reviews and analyzes the design, programming and operations of each user's system. Using hardware monitors, the branch participates in (or conducts) servicewide, regional and activity audits, as well as post-installation evaluations of operational computer systems.

Four-Point Program

These operational systems are examined by the Management Audit Branch according to a four-point iden-

tification program. First, the branch determines which programs or systems are unnecessary, which do not meet proposed objectives and where the incorrect specifications are. Finally, systems that lack adequate controls, audit trails or sound accounting principles are identified and, hopefully, corrected.

A third department, the Information Systems Audit Branch, has the goal of facilitating the audit of computer-based information systems under development by supplying technical guidance and expertise to the audit procedure. For this particular type of audit, an auditor/DP specialist team approach is used.

Objectivity is attained by having this audit team of functional area auditors (with prior experience in auditing supply management, accounting and other systems) and computer specialists take a fresh look at the development effort.

The audit of an automated management information system (MIS) covers the following:

- System concept and objectives.
- General system design.
- Design details.
- Hardware acquisition and software development system testing.
- Quality and completeness of the hardware request for proposal (RFP).
- System implementation.

The milestones or specific areas of time within the system's life cycle that are used to generate reports include considerations beginning with the initial system concept and moving up through its design, RFP issuance, contract award, prototype test evaluation and final operational reviews.

In next week's issue, Parson, assistant director of the Navy's EDP Audit Systems Division, will discuss specific audit tools.

Scanner Reads Typed Material

MANCHESTER, N.H. — Hendrix Electronics, Inc. has introduced the Typewriter II optical character recognition (OCR) scanner, designed to read typewritten text and convert the information to digital form.

Multiple font and Telex interface options can be added to the unit, enabling it to read OCR-A or foreign language characters in addition to OCR-B.

The device sells for \$15,900, a spokesman said from 645 Harvey Road, Manchester, N.H. 03103.

Sealectro Unwraps Badge Reading Device

MAMARONECK, N.Y. — The DSR-100 optical badge reader from Sealectro Corp. features optical sensing to read all standard badges, up to 22 columns, or 22 columns of a standard tab card.

A built-in strobe generator and complete solid state construction are said to provide a high level of reliability by requiring only one moving part in the unit, a spokesman claimed. The unit, which is said to consume 2.5 W (maximum), can interface to all TTL and CMOS logic, the spokesman added.

The unit is available for \$240 from the company at Mamaroneck, N.Y. 10543.

CUT!

Computerworld's September 25th Special Report, *Stretching the DP Dollar*, will tell you how to do just that — with articles, tips, and pointers on dozens of ways to save DP expense within your organization. Edited by Ann Dooley, *Stretching the DP Dollar* gives you first-hand accounts of how various users have trimmed their DP operating costs. We'll have advice from vendors as well, and you'll learn about things like:

- CPU's as a way to cut hardware costs
- Independent maintenance
- Auditing your DP system
- Buying and selling a used computer
- Upgrading outmoded equipment
- Tapes and disks: a cost comparison
- Security methods and disaster planning
- and more . . .

If you're in any way concerned with where the DP money goes in your firm, don't miss our September 25th Special Report. And if you market products or services which save DP dollars, tell people about them in this Special Supplement. Closing date is September 8. Your Computerworld representative can give you complete assistance in ad planning. Or, to reserve space for your ad, call Terry Williams at (617) 965-5800.

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Accountant Warns Users

Minis Lend Themselves to DP Crime

By Harry Zimmerman

Special to CW

General usage of minicomputers by small businesses or small business units of large companies will lead to an increase in computer-related crime. Minicomputers are by their construction and use more vulnerable as tools of embezzlement than the standard or large computers.

Furthermore, small systems users are relatively less sophisticated with respect to controlling their minicomputers. In fact, they might assume a false sense of security associated with their financial information residing on a diskette they think their employees and competitors cannot read.

Minicomputer installations vary. Some are organized and staffed like standard computer installations. Many, to be economically effective for a small business unit, are staffed by a single full-time operator with part-time backup by other company staff.

Organizational responsibility for the operation is with the general manager or the head of accounting. Programming is usually purchased on the outside with perhaps some capability for preparing new reports resident in the internal staff. This small installation, consequently, is vulnerable to so-called "white-collar" crime.

Businessmen should use minicomputers, but they should do it correctly and minimize the new risks that will be encountered. Standard computers exposed business to risks that previously had not existed under manual conditions, and now minicomputers expose business to risks over and above those associated with standard computer opera-

tions.

DP specialists and DP auditors developed a variety of procedures and controls for standard computers. Many of these procedures and controls either are not suitable or cannot be applied to minicomputers.

Standard computers are protected from potential abuse by their complexity and by the separation of duties associated with their usage. In contrast, minicomputers are by design simple to use and operate. "Menus" and operator "prompts" are provided to make them extremely easy to operate.

Minicomputer vendors boast that untrained office personnel can be taught to operate their products in a very short period. Standard computers must be operated by trained specialists.

One of the controls the auditors always checked for was limited accessibility. Minicomputers, however, usually are not in a locked room, nor do they have an operational key lock.

By contrast, standard computers are usually housed in their own separate rooms where only authorized personnel are permitted. Not many people other than trained operators have the knowledge to operate standard computers.

Standard computers are usually equipped with a separate operator's console and a printed control log. In well-managed organizations, the control log records everything the computer does, and the log is protected from tampering and alteration. The com-

(Continued on Page 46)

Small Users Urged to Widen Concern For Staff Problems

By Paul Sita

Special to CW

As the minicomputers have gained prominence, many issues have been the subjects of considerable discussion: the preparation of requests for proposal, the importance of adequate documentation, pitfalls to avoid in dealing with vendors and the need for top management to take an active role in the development of systems.

One area, however, that has not received enough attention among users of minicomputers and small business systems is the de-

velopment and management of personnel. Particularly suffering are the areas of career potential and career development.

Too many small businessmen look upon the people in their DP departments simply as clerks working with TV screens rather than typewriters. Often, it takes a year or two of rapid turnover, poor morale and near disasters before serious thought is given to the unique personnel problems inherent in DP.

In addition, the small businessman may not realize how quickly DP becomes a critical area of company operations or how difficult his personnel may be to replace. Some pertinent factors here are:

- DP is a focal point for business operations, company forms and special calculations.

- In small businesses, very few DPers just keypunch or run jobs; most of the personnel are fairly versatile. This versatility is valuable to the company and shouldn't be underestimated.

- When in full swing, DP is often critical to the day-to-day operation of business. Within a very short period, the processing of a typical day's business becomes impossible without the aid of a computer.

- The lack of sufficient time and manpower resources to produce and maintain adequate documentation creates extreme problems when employee turnover occurs. This turnover must be kept at a minimum.

A small business with a minicomputer does not have the kind of visible personnel structure a large DP shop has. As a result, employees cannot perceive the growth path

(Continued on Page 44)

First-Time Users Warned Not To Slight Mini Programming

Choosing a minicomputer system intelligently is seldom easy, even for an experienced user, but for a first-timer the task can prove especially bedeviling and fraught with peril. In the following article — the first in a two-part series — a user offers some hardware selection tips distilled from his firsthand experience with minicomputer procurement. Next week, the series' concluding installment will examine the software side of the minicomputer selection question.

By Terry L. Reid

Special to CW

With the introduction of the new, low-cost minicomputer hardware, many smaller companies have either installed their own computer systems or have considered the possibility of putting a computer to work for them. One important area that is often

neglected by a small, first-time user is programming for the machine.

A system can never be any better than the combined effectiveness of the hardware and the programming.

Before you can decide who is going to do your programming, you must first have a basic idea of the type of functions you want your minicomputer to perform. As the system's end user, you must be able to describe what you want to the individual who will furnish your programs.

If your company does not have someone who is experienced in the use and management of a computer, you would be wise to seek an outside source with the necessary knowledge and experience to work with you on the development phase.

(Continued on Page 46)

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MINICOMPUTERS
INFORMATION

Recording Media Withstand Wear

WALTHAM, Mass. — Three additions to Kybe Corp.'s Accutrack family of data recording products last for more than 12 million passes without disk errors or significant medium wear, according to a Kybe source.

The product introductions include 8-in. flexible disk, 5.25-in. mini disk and magnetic card models.

The offerings suit most minicomputer disk systems, including models compatible with IBM, Memorex Corp. and Shugart Associates prod-

ucts, the spokesman explained. They are also said to suit single-sector, 10-sector and 16-sector mini disk systems.

Like all other members of the Accutrack line, the latest Kybe recording media provide a crease-resistant jacket and a chemically bonded, lubricating overcoat that forms an integral part of a disk and thus prevents wear and medium contamination, the source said.

They are also burnished to provide a flat, uniform recording surface and eliminate almost all error-causing drag, the source added.

Prices of 10 8-in. or 5.25-in. Kybe disks with filing sleeves and a desktop storage box start at \$37.50, while a box of 25 of the company's magnetic cards costs \$20. Bulk packaging and quantity discounts are also available from 132 Calvary St., Waltham, Mass. 02154.

DPers Merit More Care

(Continued from Page 43) that is or should be open to them.

The traditional DP job classifications and progressions — junior computer operator through lead computer operator, data entry clerk through data entry supervisor, programmer trainee through lead systems analyst and project leader — simply don't apply to the small business environment.

And not being able to perceive a growth path is one of the chief reasons for employee dissatisfaction and turnover. The immediate answer is not to develop a series of job classifications more applicable to the small business system world. Such a scheme will probably emerge of its own in the next few years as the job market matures.

What is necessary is management with an understanding of the unique characteristics of the small business DP environment and an awareness of the personnel problems caused by these characteristics. Here are some points to keep in mind:

- The functions within a DP department should be analyzed and sorted out for the types of skills and level of responsibility required.

- Employees should be encouraged to attend courses to expand their knowledge of the various facets of DP. They should get to know the system they work with more fully, learn programming and job languages and gain other skills.

- Job title should not be the only factor affecting employee perception of job worth. The skill and integrity with which duties are performed must be stressed and rewarded as well.

It is management's responsibility to organize a DP environment into logically distinct functions with perceivable work-role differences that affect employee perception of growth potential.

Paul Sita is DP manager of the Long Island-based Dartmouth Plan, Inc.

Printers Replace DEC's

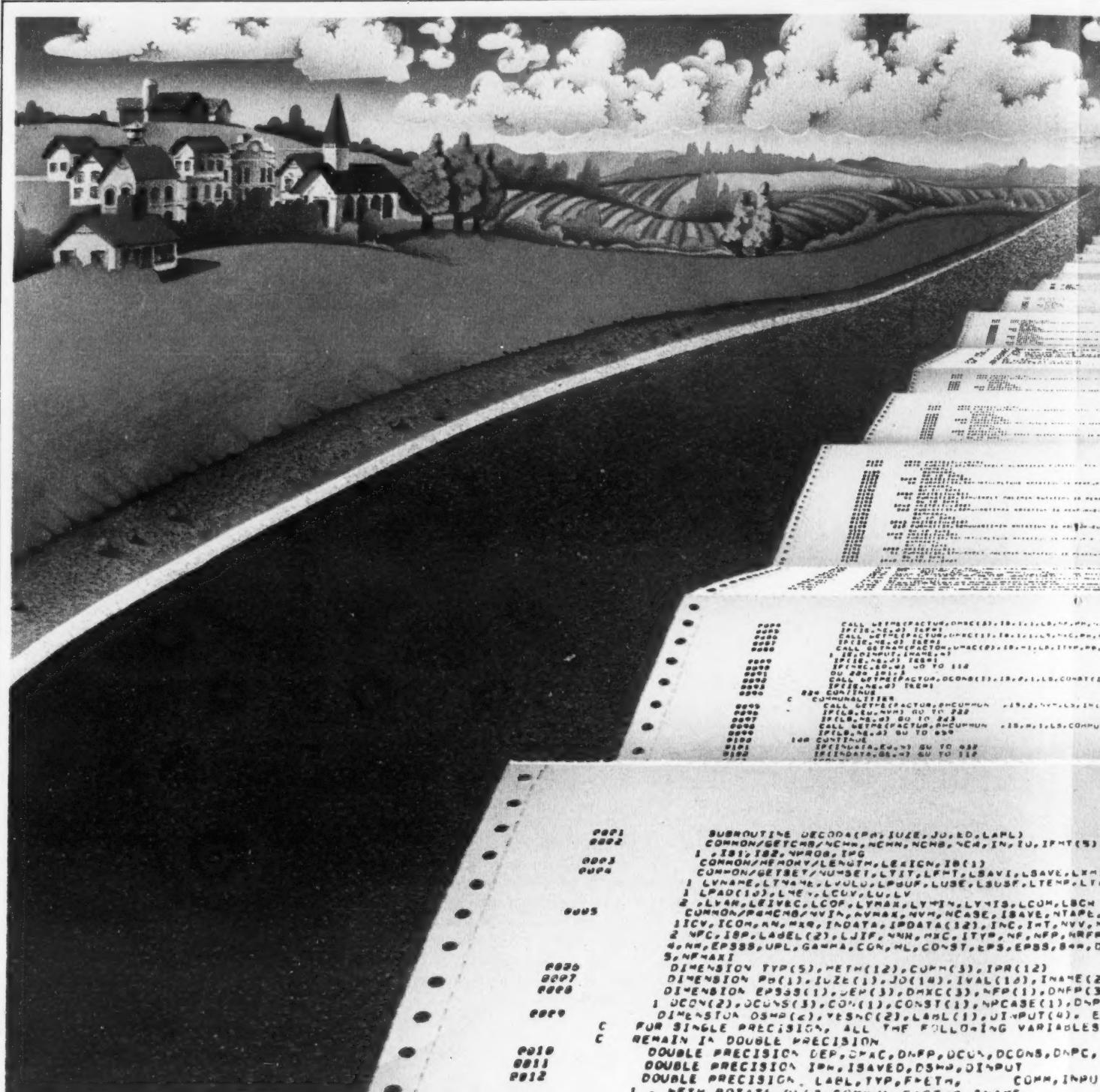
COSTA MESA, Calif. — Exact copies of the printers for the Digital Equipment Corp. VAX-11/780 are now available with few of the delivery delays typical of their DEC counterparts, according to a spokesman for Computer Peripheral Services Corp. (CPS).

The CPS-supplied printer models include Dataproducts Corp. 2200 series and Charaband units, which CPS has equipped with VAX-11/780 plug-compatible controllers.

Users can attach up to 14 of the printers, which range in speed from 300- to 1,800 line/min, to each VAX-11/780 system, the source said.

Prices for the CPS equipment range from slightly more than \$6,000 to as much as \$30,000.

CPS is at 3187-F Airway Ave., Costa Mesa, Calif. 92626.



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And VAX educational systems for large-scale FORTRAN users start as low as \$158,000. You get a VAX CPU with 256 Kb of main memory and 8 Kb

of cache, VAX/VMS operating systems with complete utilities including an interactive debugger, FORTRAN IV compiler, tape drive, 67 Mb disk, eight asynchronous lines, and a CRT or hard-copy console.

All of which makes the new human-engineered VAX the perfect system for people in computer centers and academic departments who are running big programs, arrays, data reduction and analysis, and large statistical packages.

VAX also offers ANSI 74 COBOL and full BASIC PLUS 2 to make it ideal

Mini Speeds Answers to Policyholder Queries

PHILADELPHIA — Clerks who formerly spent several minutes retrieving information for just one telephone inquiry can now obtain the same material in a few seconds, thanks to a minicomputer system installed recently at Higham-Whitridge, Inc., an insurance agency specializing in student coverage.

With the system, Higham-Whitridge — a division of the Babb, Inc. insurance agency —

maintains a computerized list of the company's approximately 200,000 student policyholders, according to administrative manager Judith Johnson. By accessing that data base through CRT terminals, the firm can tell a telephone caller the status of a student's insurance claim in no more time than a clerk needs to enter the policyholder's identification number on a console key-

board.

The system has also cut from as much as three days to a few seconds the time required to calculate loss ratios. These show where Higham-Whitridge's costs are rising fastest and allow underwriters to set next year's premium rates accordingly.

Higham-Whitridge originally managed its policyholder data base manually. But by early 1977, two years after an

intensified marketing effort doubled the firm's number of policyholders, "it was becoming obvious that our traditional system would be overloaded and a change was required or we would have to curtail growth," executive vice-president Mervin G. Sneats, recalled.

Dissimilar Data

Under the manual system, the company's policyholder

data often proved insufficiently timely and forced different groups within the organization to operate with dissimilar data. Recognizing this problem, company officials concluded they would have to replace their manual processing system with an on-line, interactive data base.

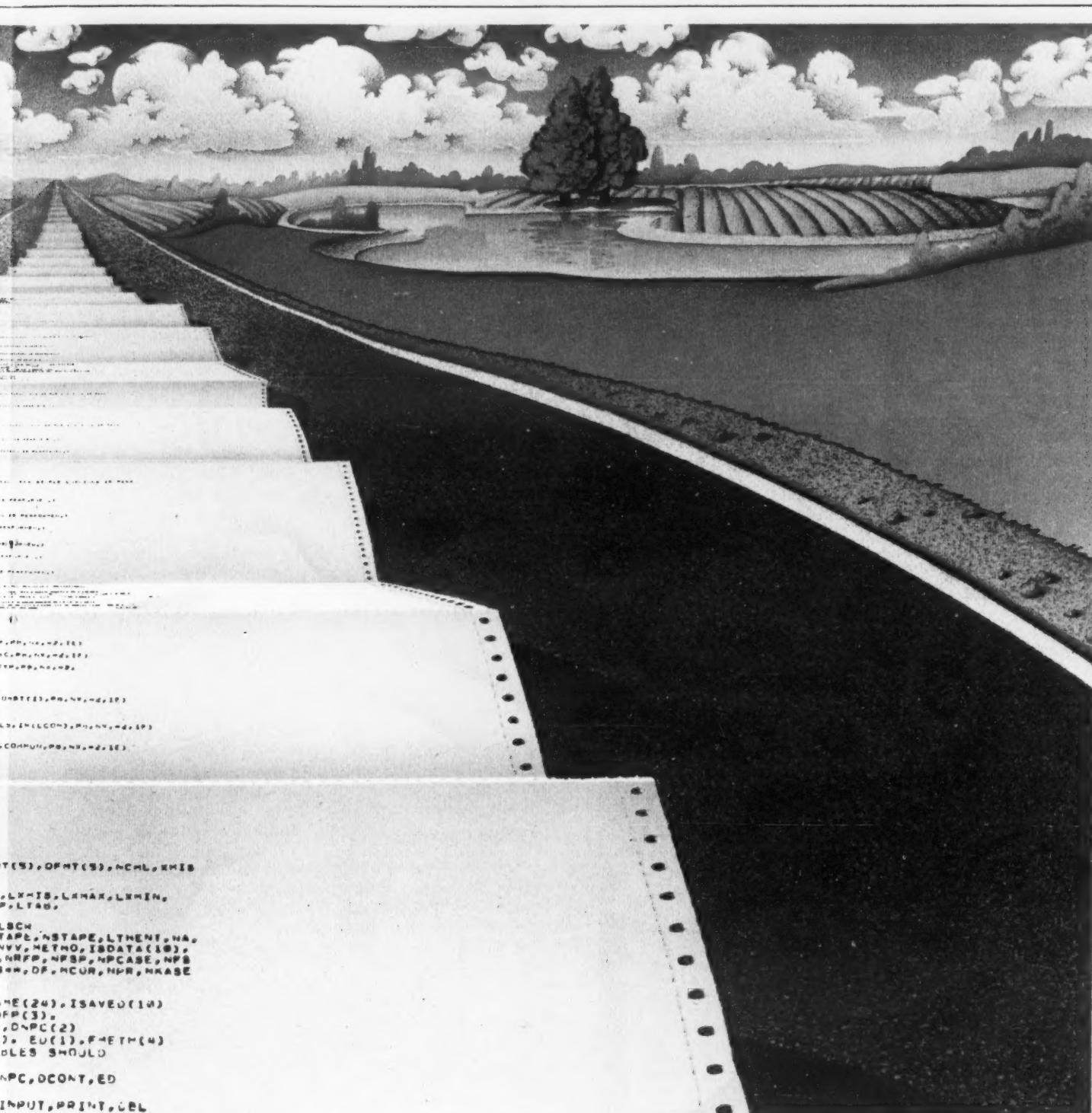
To find a system that could meet their DP needs, company officials hired a consulting firm to prepare bid specifications and provide a list of available configurations. "We described the jobs we wanted performed, and [the consulting firm] prepared a detailed spec matrix from which a request for proposals was produced," recalled Jack McCutchen, Babb's vice-president and chief financial officer.

Eventually the company narrowed the field of competing vendors to two — Wang Laboratories, Inc. and Data General Corp. — before finally opting for the Wang equipment. Built around a 2200VS minicomputer, the configuration incorporates a 120 char./sec Wang 2231V printer, 220 line/min 2261V matrix printer, two 75M-byte removable disk systems and six CRT terminals.

Commenting on the reasons behind the firm's hardware selection, McCutchen noted, "Our present demands would have fully loaded the DG system." The 2200VS-based system, by contrast, seemed to offer almost indefinite expandability — a characteristic the Babb executive and his colleagues consider important.

After evaluating and selecting its hardware, Higham-Whitridge contracted with Pittsburgh-based Aptech Computer Systems, Inc. to produce the necessary insurance software package.

The insurance company can now generate various hard-copy reports including customized draft registers, loss ratio reports and loss experience analyses.



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Minis Pose Growing Crime Risk

(Continued from Page 43)
puter cannot do anything that does not get recorded on the control log, and the control log is reviewed by supervisory personnel.

In contrast, on a minicomputer, the control console and input station are combined and any printed record can be discarded without evidence of its ever having existed. Thus, when the staff is out to lunch or after everyone goes home, anyone with very little DP knowledge can use the minicomputer without authority.

Three Protections Missing

Three of the principal protections that auditors depend upon for standard installations do not exist in a minicomputer environment:

- Division of duties (The person who keyed the input transactions was not the same person who operated the computer).
- Limited accessibility of the equipment (More people are capable of operating the machine, and they can get undetected access to the machine).
- Audit trails (Printed rec-

ords of processing are unprotected).

In this environment, a petty thief can cause financial loss to his employer. He can change data files without being detected. For example, he can alter the price list table resident on the disk of an invoicing application so as to temporarily lower the sales price of certain items destined to be invoiced to a chosen company.

This change can be made by a person who has no knowledge of computer programming. He must only know how to access the price list table, and that information is available in an operator's manual.

Certain minicomputers offer "prompting" displays that guide untrained users to programs and files without having to refer to an operator's manual.

A more personal form of defalcation can be performed on a payroll application. A petty thief can access the payroll records and give himself a raise in gross salary that he offsets with an increase in tax

withholding deduction. An employer who reviews the net payroll check before signing it will not detect this unauthorized raise. The net amount of the check will not change.

The proceeds of this theft will ironically be paid by the government in the form of a tax refund.

In the environment of a standard computer, such unauthorized data changes could not be made because:

- The usual division of responsibilities requires the transactions to pass through several people who check for authorization.
- The computer is accessible only to operations staff.
- The machine is too complex to be operated by other than trained staff.
- Records of all changes and machine usage are printed and examined.

Not all these factors are necessarily present in standard DP facilities, but enough exist to provide protection.

Harry Zimmerman is manager of management advisory services at Wiss & Co., an East Orange, N.J., accounting firm.

Users Often Neglect Software

(Continued from Page 43)

In most areas of the country, either an accounting firm or a computer consultant can be hired to work for you. You can also hire someone into your company with the necessary experience to do this phase of

the work and then have him stay on to manage the DP department after it is installed.

With either option, you should base your selection on the individual's experience with computers and his knowledge of your type of business.

You and your personnel must be willing to work with your development source in this phase. You will be providing the answers that will form the basis of your programming, and it will be you who will suffer if this phase of the work is not done correctly.

Sizing Up Needs

After deciding what systems you need, you should evaluate the equipment you will be using to see if it will be able to handle the load of the required systems. If you already have a computer system, the basic question that must be answered is: Will it be able to handle the increased work load effectively?

If it can, you will be ready to select the programming source to be used. If it will not or if you are a first-time user, you should do a study of all the available hardware options and, based on the best machine for the money, decide which you will install.

Do not limit yourself to only one computer vendor. Look at as many vendors as you can.

The selection of a system requires the same sort of cost study you usually would do for any other machine. Following are some of the questions that must be answered:

- Cost? In addition to the machine cost, you will incur costs for program development; any building changes, rewiring or environment controls needed; and staff training.

- Will the machine allow for growth? You should select one that will allow for an easy, planned growth as your needs increase.

- Is the machine flexible? It should be able to handle many types of jobs.

- Can you get fast service for the machine? You must be able to get efficient service for the machine when it breaks down.

- Is the vendor reputable? Be sure to visit working installations to see if the vendor's claims for the machine are true.

- How much instruction is available from the vendor? Most vendors offer courses in all phases of computer operations.

Terry Reid is purchasing agent and programming manager of the Urbana, Ill.-based Harry Gill Co.

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MICROCOMPUTING

Four Regional Events Slated Micro Show Season Fast Approaching

By Tim Scannell
CW Staff

As the long, sun-drenched days of summer draw to an end, the microcomputing enthusiast's fancy turns to shows — and at least four around the country in the next few months promise to be of some interest to hobbyists and small businessmen.

The New York Coliseum is gearing itself for the upcoming Personal and Business Small Computer Show where, according to a spokesman for the event, "present and future worlds will coincide." The exposition, slated for Sept. 15-17, will reportedly be "crammed" with demonstrations and lectures illustrating the symbiotic relationship of man and machine.

This particular show will stress both the practicality and affordability of computer systems for home and business applications, the spokesman stated. Systems on display will be able to balance the company checkbook, make music, play games and "perform countless procedures which simplify business procedures and improve the quality and ease of daily life."

Lectures will run continuously during the show and are free to those enthusiasts on the exhibit floor, the spokesman added.

Registration fees are \$5 per day at the Coliseum gate; or \$5, \$9 and \$13 for one-, two- or three-day advanced ticket sales. Information about the festival and registration information can be obtained from the coordinators, 78 E. 56th St., New York, N.Y. 10022.

Dallas Expo

Sparkling seminars and "a super, super group of speakers" will highlight the International Microcomputer Exposition to be held Sept. 29-Oct. 1 in Dallas, according to Joseph Darby, the executive coordinator of the show.

One of the basic aims of the exposition, Darby noted, will be to eradicate the mystery and complexity surrounding microcomputing in general. The show will also seek to educate both the average businessman and nontechnical employee, as well as the die-hard microcomputer enthusiast, in the latest industry offerings and scientific developments.

"The microcomputer industry itself has

Gnat Systems Get Arithmetic Board

SAN DIEGO — Gnat Computers, Inc. has introduced a general-purpose arithmetic processing board for its microcomputer systems that is said to speed complex math operations in real-time process control, scientific computation and multiuser systems.

The Model 8008 arithmetic processor contains built-in add, subtract, multiply, divide, square root, logarithmic, exponential and trigonometric functions in a 32-bit floating-point format. It also contains an AM9511 computational device which is separately addressable for parallel processing or multiuser systems, according to a spokesman.

In addition, the unit is equipped with a programmable interval timer and integral interrupt controls for increased utility and management of multitask problems, the spokesman said.

The Model 8008 reportedly reduces the time required for math functions by more than 10 times and can accommodate up to four AM9511 processing modules.

The processor with one AM9511 module is priced at \$295 from Gnat at Unit 6, 7895 Convoy Court, San Diego, Calif. 92111.

developed so much in both directions (toward technical and nontechnical people) that we really went both ways and tried to stress it both ways," Darby pointed out.

More than 20,000 people, "including 200 from Canada and 200 to 300 from Mexico and Brazil," are expected to attend the three-day extravaganza, Darby said. Speakers will include Dr. Portia Isaacson, internationally known microcomputer scientist, teacher, writer and lecturer; Dr. Adam Osborne of Osborne Associates; and Carol Ogdin, noted for her work with the National Bureau of Standards on the S-100 bus system.

Preregistration fees for the exposition are \$4 per day per person or \$8 for the entire three-day series. At the door, registration prices will be \$6 per person per day and \$10 for the whole show. Materials and registration packets are available from the conference director at 413 Carillon Tower, 13601 Preston Road, Dallas, Texas 75240.

Midwest Show

On Oct. 5-8, Chicago will host the second annual Midwest Personal Computing Expo '78, a four-day show which last year attracted more than 12,565 computer enthusiasts. "The highlight of the show," according to spokesman Jerry Biber, "would have to be the obvious switch from the previous 'hobbyist' emphasis to an emphasis on the small and medium-size business person."

The show is sponsored by Industrial and Scientific Conference Management, Inc. (ISCM), a worldwide organizer of exhibitions and seminars of this type, Darby stated.

Personal Computing Expo '78 is designed to draw people "roughly from the surrounding five-state area" and, consequently, is the only midwestern computer show planned for this year, Biber explained. The show is

reportedly bent on examining the industry's latest developments and passing this information along to the micro hobbyist and the businessman who might be considering computers.

The Midwest show will feature more than 150 exhibits, and visitors will be encouraged to try their hand at various computer games, home and business computerized record-keeping, music synthesis and an assortment of computer-enhanced learning programs, Biber said.

The registration fee for the Personal Computing Expo is \$10 for the four-day event. Details on discount admissions and further information can be obtained from the exposition director at ISCM, 222 W. Adams St., Chicago, Ill. 60606.

Boston Fest

Finally, on Oct. 7, Boston will see the staging of Home/Business Computers '78, sponsored by the Boston Computer Society. The one-day show will take place at Boston University and feature a variety of computers, guest speakers and assorted demonstrations.

The show is basically limited to participants in and around the area and will emphasize home business computers and packaged "appliance-type" computing units, Tim Quinlin, a Society spokesman, stated. The show will strive to be "informative, especially in terms of the average person who hasn't had a lot of exposure to home systems," he said, "yet less away from the hobbyist than a lot of other shows."

Computers '78 will cost \$2 for the general public and is free for members of the Boston Computer Society. Interested individuals may write or call the society for tickets and information at 17 Chestnut St., Boston, Mass. 02108.

Micro Development Network Accommodates Eight Users

GARDEN GROVE, Calif. — Futuredata Computer Corp. has unveiled a universal microcomputer development system network that is said to permit sharing of a user's disk memory and printer resources with up to eight separate workstations.

The Multistation Network of Microcomputer Development Systems consists of a network control processor, a double-sided, double-density floppy disk unit, a medium-speed line printer and up to eight satellite Advanced Microcomputer Development System (AMDS) terminals.

The terminals combine a microprocessing unit, keyboard and CRT and reportedly support 8080, 8085, 8086, 6800, 6802 and Z80 hardware/software development systems.

The network control processor was designed to share the disk unit and the printer on a "round-robin" basis among the satellite terminal stations, a spokesman explained. The unit also controls access to the disk drive and the printer, providing both exclusive and shared access to files, freeing of files when a satellite station is powered down and queuing of printing requests.

The maximum wait time for access to the user's disk files, even in "worst-case" situations where all the terminals are active at the same time, is approximately 9 sec, the spokesman claimed.

The price of a typical system, including eight AMDS terminals, the network control processor, a 2M-byte disk drive, 120 char./-

sec line printer, four real-time emulators and two 48-channel logic analyzers, is \$61,550 or \$7,694 per station from Futuredata at 11205 S. La Cienega Blvd., Los Angeles, Calif. 90045.

University Working To Adapt Pascal For MDC-100 Use

SAN DIEGO — Programmers here at the University of California are presently under contract to adapt Pascal for use on the American Microsystems, Inc. (AMI) MDC-100 microprocessor development center, according to an AMI spokesman.

The adaptation, the spokesman explained, is aimed at allowing the MDC-100 to support additional microprocessors with a minimum of software conversion. In addition, programmers will only need to know Pascal, rather than the assembly language of each new processor, as systems are added and upgraded.

AMI plans to offer the Pascal implementation, after it is fully developed, on its MDC-100 product line. Additional information on procedures and progress can be obtained from the firm's Microprocessor Development Section, 3800 Homestead Road, Santa Clara, Calif. 95051.

Percom Offers Add-On Drives for TRS-80

GARLAND, Texas — Percom Data Co. is manufacturing add-on minifloppy disk drives for the Tandy Radio Shack TRS-80.

The unit is described as an exact replacement for the Radio Shack minidisk system and includes the drive, drive power supply and enclosure.

The Percom unit sells for \$399 compared with \$499 for the equivalent Radio Shack disk system, the company said.

Percom said the drive is based on the Shugart SA-400 — the same unit found in the Radio Shack model. It offers a data transfer rate of 125k bit/

sec, and access time is a fraction of a second, the firm said. The drive power supply features overload current limiting and thermal protection.

Disk drives may be interfaced to the TRS-80 with the Radio Shack TRS-80 expansion interface, which accommodates up to four drives (and other peripherals) and includes controller electronics and a four-drive cable. Operating software for all drives comes with the purchase of the first drive from Radio Shack.

Percom Data Co. is located at 318 Barnes, Garland, Texas 75042.



Percom Floppy for TRS-80

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Hayden Prints Micro Primer

ROCHELLE PARK, N.J. — A text written for those new to the home computer field has been published by Hayden Book Co., Inc.

Home Computer Systems Handbook emphasizes the practical knowledge the home computer user should have in order to purchase, assemble, interconnect and program a microcomputer, the publisher said.

The book provides a background in digital logic fundamentals, number systems and hardware and software basics, as well as an introduction to programming on the machine level and with higher level languages such as Basic.

Home applications are also described, the publisher said.

Second Book

Another book recently published by Hayden, *Mini-Micro Soldering and Wire Wrapping*, includes explanations of these techniques from simple components to more complex breadboarding.

The book tells how the individual electronic components are fastened together and how best to remove them during repair. It also explains the tools necessary for these jobs.

Home Computer Systems Handbook costs \$8.45 and *Mini-Micro Soldering and Wire Wrapping* costs \$3.95 from Hayden at 50 Essex St., Rochelle Park, N.J. 07662.

Catalog Covers Books on Micros

FORT WALTON BEACH, Fla. — The Computer Bookstore has published the "Master List of Computer Books," a summary of more than 125 computer-related books.

The books relate to issues and information in microcomputing. Each listing includes the title, summary and price of books from more than 15 publishers.

The literature covers introductory works, microprocessors and microcomputers and hardware and software.

The catalog costs \$1.50 from The Computer Bookstore, 796 Navy St., Fort Walton Beach, Fla. 32548.



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HIS Working on Image as Mini Maker

By Marcia Blumenthal
CW Staff

BILLERICA, Mass. — Not too long ago, a high-ranking Honeywell executive said that Honeywell Information Systems, Inc.'s minicomputer line was the best-kept secret in the industry.

James R. Pompa, vice-president and general manager of the Small/Medium Information Systems Division, agreed that HIS is not yet perceived as a mini maker. However, the newly launched additions to the Level 6 line together with some strong marketing strategies will change that image, he asserted.

In marketing the Level 6 machines, HIS is aiming at two distinct markets — the end user and the OEM/systems builder. "One of our main objectives," Pompa said, "is to expand outside the present HIS customer base with minicomputer products and systems components that support HIS and non-HIS host computers in the communications and distributed processing environments."

HIS is targeting the IBM base, as evidenced by its IBM protocols for Level 6 and its emphasis on the distributed systems environment, a spokesman suggested.

Another objective is to increase the penetration of the existing base of customers and

add important segments of the OEM/systems builders markets.

In the early 1970's, Pompa recalled, HIS received a lot of contracts for large-scale systems. This not only diverted the company from stressing its mini operation, but shifted the sale of minis to intracompany customers rather than the external market. This was particularly true in the OEM/systems builder sector, Pompa added.

"There is no denying that we'd lost some general market appeal with our System 700," Pompa admitted. "With Level 6, HIS is

back in the OEM/systems builder market."

Entered Mini World in '66

Paradoxically, HIS has been in the mini business longer than any other mainframe, Pompa claimed, starting with the acquisition of Computer Control Co. in 1966.

So although HIS has years of experience in making minis, company executives observed that the marketing of the mini line has been neglected, resulting in the image problem the firm is presently trying to overcome.

(Continued on Page 52)

MSA Users Taking Advantage Of Continuous System Support

By Nancy French
CW Staff

ATLANTA — Management Science America, Inc. (MSA) doesn't merely sell a product, it "sells a continuous solution to a problem — that's what our customers want," Executive Vice-President William M. Graves said in a recent interview here.

Graves' opinion seems to be borne out by the number of MSA application package users that elect to purchase maintenance contracts even when their systems need not conform with government regulations. Those maintenance contracts cost users about 12% of the package price per year, Graves said.

As many as 88% to 90% of MSA's general ledger system users are on maintenance and this is a fairly static area, he indicated. But in the payroll/personnel system, for example — an area strictly regulated by federal law — the percentage of users on maintenance is about 95%, he said.

This philosophy of continued system support is costly. MSA has already spent \$5 million on its general ledger system, with \$1.6 million of that total going for this year's enhancements alone. But the cost quickly melts away when it's spread over thousands of users, Graves said.

The Atlanta-based firm, which today employs more than 350 people, is set to hire about 70 more by the end of the year for positions nationwide. In addition, the company recently established a branch in Sydney, Australia, to better serve its customers "down under" — one of which is Qantas Airlines.

The prosperity that was evident here at MSA's Spring user meeting, which was at-



Photo by T. Scannell

Yes, the tiger is real. MSA President John P. Imlay Jr. poses with a tiger that symbolizes MSA's sales attitude at the firm's spring users' meeting. Pictures with a tiger are "de rigueur" at company parties. This beast's trainer kept the animal in a good mood throughout the photo session with sips from a milk bottle and gentle taps on the nose. Want to try it at your next party?

tended by a majority of the firm's 3,000 customers, was a far cry from the bankruptcy that resulted from overambitious expansion in the early 1970s. But that's all history now.

MSA came back from Chapter 10 in 1971 to post revenues of \$6.2 million in 1974.

(Continued on Page 51)

Hotel Market About to Take Off?

By Marcia Blumenthal
CW Staff

WALTHAM, Mass. — Although the market for property level hotel/motel systems has been sluggish to date with only 165 systems installed worldwide at the end of 1977, the market is expected to take off. By 1982, about 2,000 systems will be installed in the U.S., with the dollar value of the installed base increasing fivefold over the five-year period, according to *Autotransaction Industry Report* (AT/IR), a publication of International Data Corp.

Assuming a relatively stable economic environment, AT/IR pointed out several trends that are expected to spark the market for these self-contained computer systems located at individual hotel/motel properties.

Of particular importance, according to AT/IR, is the reduction in system costs resulting from microprocessor technology and better software. These developments are creating a growing customer base among smaller hotel properties which up to now have not been able to afford a property level system.

Between 1973 and 1978, AT/IR noted, hotels with 200 to 349 rooms experienced 100% growth, increasing from 750 to 1,500 properties, whereas the 500-plus-room hotels, the traditional market for property level systems, has grown only 38% from 5,000 to 6,900 properties in the five-year period.

Furthermore, developments of on-line, independent modules with high-level languages and sophisticated communica-

(Continued on Page 50)

Supershorts

Honeywell, Inc. has completed the transfer of its computer-related business of Mitsubishi Office Machinery Co. Ltd. (MOM) to its new subsidiary, Honeywell Information Systems Japan, Inc. Honeywell owns 80% of the capital stock of the new firm, with MOM, the former distributor of Honeywell's computer products in Japan, holding 20%.

Analogic Corp. has named F&F Associates of Hicksville, N.Y., to represent the firm's analog-to-digital conversion modules and data acquisition systems products.

Graham Magnetics, Inc. has named its main plant the "George A. Jagers Plant" in honor of its founder and board chairman.

State Street Bank and Trust Co. of Boston and Pace Data Systems of Philadelphia have agreed that Pace will provide State Street's batch and on-line accounting services to credit unions in eastern Pennsylvania, Maryland, Washington, D.C., Delaware and southern New Jersey.

Datographics, Inc. has opened a new sales office in Hatboro, Pa., in the metropolitan Philadelphia area. The new facility offers complete service, supplies and software capabilities for the company's computer output microfilm and CRT terminal systems.

Pansophic Systems, Inc. recently celebrated the installation of its 5,000th product at an award presentation at Medical Computer Systems, Inc., the firm purchasing the milestone product.

Micropolis Corp. has instituted a newsletter which will be a forum for the exchange of information on user-developed software packages.

Heuristics, Inc. has appointed Eurapple, a subsidiary of Apple Computer, Inc., as its international marketing agent in all foreign countries except Canada.

Sluggish Hotel Systems About to Take Off

(Continued from Page 49)

tions capabilities will contribute to the growing demand for these systems, AT/IR predicted.

Nearly all the hotel systems on the market now are mini-based, stand-alone, modular, on-line systems. The two major applications are front office — typically including reservations, registration and housekeeping — and back office, incorporating accounts receivable, accounts payable, payroll and general ledger.

The primary virtue of most property level systems is the front office package, which is usually on-line. While back-office functions have often operated in batch mode, most vendors, in response to users' demands, are now developing packages with on-line back

office capability, AT/IR noted.

Hotel operators have also complained about the communications ability of these systems. Accordingly, vendors are designing systems that can hook up with remote CPUs, nationwide reservations networks and corporate headquarters, AT/IR said. These systems are also beginning to feature cable TV links between the hotel's front desk and point-of-sale (POS) equipment at the hotel's bars and restaurants or between housekeeping, security and the front desk, AT/IR reported.

Energy costs are another often-heard complaint of hoteliers. Between 1975 and 1976, energy costs jumped 19%. Moreover, according to AT/IR, the energy crunch of 1973 and 1974 and the economic recession that followed deci-

mated the then-fledgling market, causing a major shakeout in vendors.

Of the 10 major suppliers five years ago, only Electronic Engineering Co., Micro International and Sigma Data Systems, Inc. have survived intact, AT/IR claimed.

While IBM continues to sell hardware and software to the hotel market, it offers no bundled package, AT/IR reported, adding that NCR Corp.'s two systems took a bath.

More than two-thirds of the 1977 installed base (165 systems) was held by five companies: Motorola, Inc., Electronic Engineering, Micor, IBM and Sigma Data, AT/IR stated.

Aside from the vagaries of the marketplace and the economy and the complaints of hoteliers, industry ob-

servers cite software development as the key to the property level hotel segment survival. A system that works well at one property fails at another nearby because the operations of the two hotels differ so much, these observers said.

Several companies are responding to the industry challenge. Hotel Computers, Inc. is about to re-enter the market with a \$5,000 Zilog microprocessor-based system geared for properties of less than 200 rooms, AT/IR reported.

Electronic Engineering is also marketing to smaller properties. Although well-regarded, according to AT/IR, its system is considered expensive, based on a Data General Corp. Nova and Electronic Engineering's own CRT.

Micor has also upgraded its hotel system, developing an on-line modular package boasting an intelligent POS terminal.

Another veteran, Sigma Data, is selling a system called Data Host, which is based on Four-Phase Systems, Inc. equipment.

The property level hotel system market is attracting new entrants, AT/IR said, notably Hewlett-Packard Co., Wang Laboratories, Inc. and Honeywell Information Systems, Inc.

Corporate Data Offered by IRS

WASHINGTON, D.C. — For aggregate financial data on corporations, one can turn to the Internal Revenue Service's (IRS) published analyses of information submitted on tax returns.

In *Statistics of Income — 1973 Corporation Income Tax Returns*, the data is broken down by size of business receipts and by 67 industry classifications. The publication features complete income statements and balance sheets from corporations.

In that publication, the IRS treats special subjects such as small business corporations that file under form 1120-S, domestic international sales corporations (Disc) and information about consolidated returns. Also treated is information by size of income subject to tax, by size of tax and information about investment credits.

The data, which does not include sole proprietorships or partnerships, can be helpful in identifying markets. For example, there are 225,187 corporations in the U.S. with sales of more than \$1 million, 19,484 with sales of more than \$10 million and 503 with sales exceeding \$500 million.

Another publication, *Preliminary Statistics of Income — 1975 Corporation Income Tax Returns*, presents six tables summarizing financial data, with no balance sheet information except for total assets and inventories.

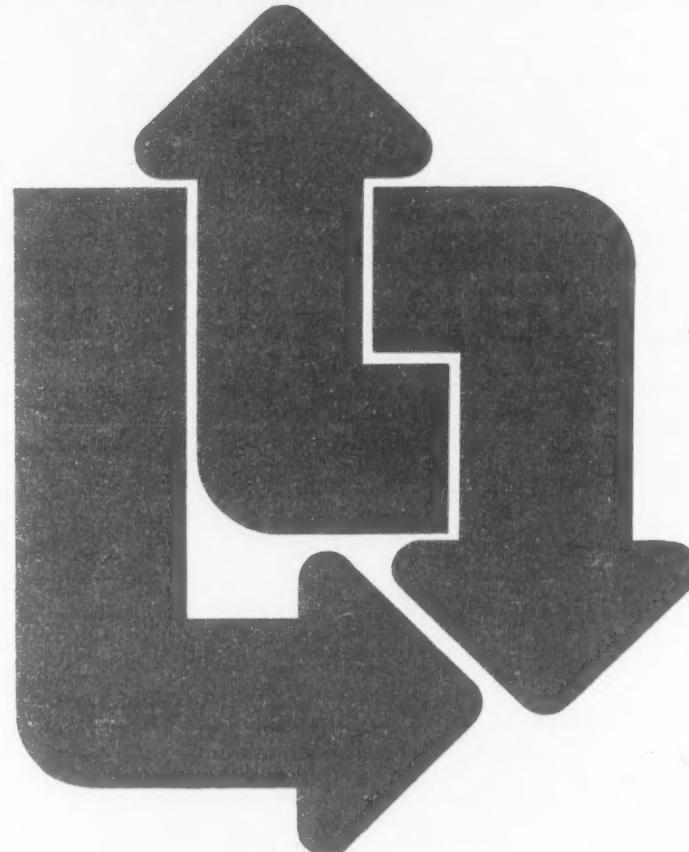
The six tables list all corporations by major industries, returns with profit by industry and returns for all corporations by size of total assets of each corporation and its divisions.

The data's only drawback is its age. The latest complete analysis is for 1973.

Statistics of Income costs \$4.25 and *Preliminary Statistics of Income* costs \$1.20 from Corporation Statistics, Internal Revenue Service, 1201 E St. N.W., Washington, D.C. 20224.

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For a brochure giving full details of the conference and its list of speakers, contact Online Conferences Ltd. C/o The Wayne Smith Company, Suite 810, 500 12th St. SW, Washington DC 20024. Tel: (202) 484 5620.

MSA Users Contract For Ongoing Support

(Continued from Page 49)

\$7.9 million in 1975, \$12.3 million in 1976 and \$17.3 million in 1977. According to President John P. Imlay Jr., the firm is projecting \$23 million in revenues for 1978.

The firm is expanding "in a controlled, planned fashion" these days and sticking to what it does best — application software, Imlay explained.

Product Forthcoming

And a new product is on the horizon, according to Graves. At the moment, a forecasting and modeling package, requested by about 17 users, is being designed with advice from those potential users which include manufacturers, airlines, banks and credit unions, according to Graves.

MSA specialists are meeting with users individually as well as in group sessions to develop the product to everyone's satisfaction.

Those collaborating on the project have systems ranging from IBM 370s to Burroughs Corp. B6700/6800s to Honeywell Information Systems, Inc. Level 66 systems, Graves said, adding, "it's not being sold with a committed delivery date, but is expected to be completed by the first quarter of 1979."

MSA prides itself on the fact that it develops its own products. "We don't merely buy a product from some user that designed it for his own business needs and then put blue covers on it and sell it," Graves asserted. "We begin from scratch to maintain quality control" and design systems so they can be converted for use on various manufacturers' hardware, he said.

Since MSA develops its own products, they are not peculiar to the operation of any particular industry and are more adaptable to a wide range of users — from manufacturers to banks, according to Graves. However, to assure that such a broad range of users can apply the systems effectively, MSA employs industry specialists to work with individual customers after the applications have been sold.

Unlike many software and data base management system firms that stay out of the non-IBM systems area because there are fewer potential customers, MSA "wades right in" because "the non-IBM customers tend to buy lots of applications software, and many of the company's non-IBM users buy more than one package at a time, he said.

MSA is willing to convert any package to any particular machine type as long as it can see enough potential customers to make the package worth supporting, he said.

"We have to look into market estimates and also at what the vendors are doing. It's not the conversion costs that kill you; it's the cost of warranty and continued support of the package," Graves said, adding, "we don't convert a package if we can't support it."

MSA's users are 70% (about 2,600) IBM; 8% (or 250) Burroughs and 22% others.

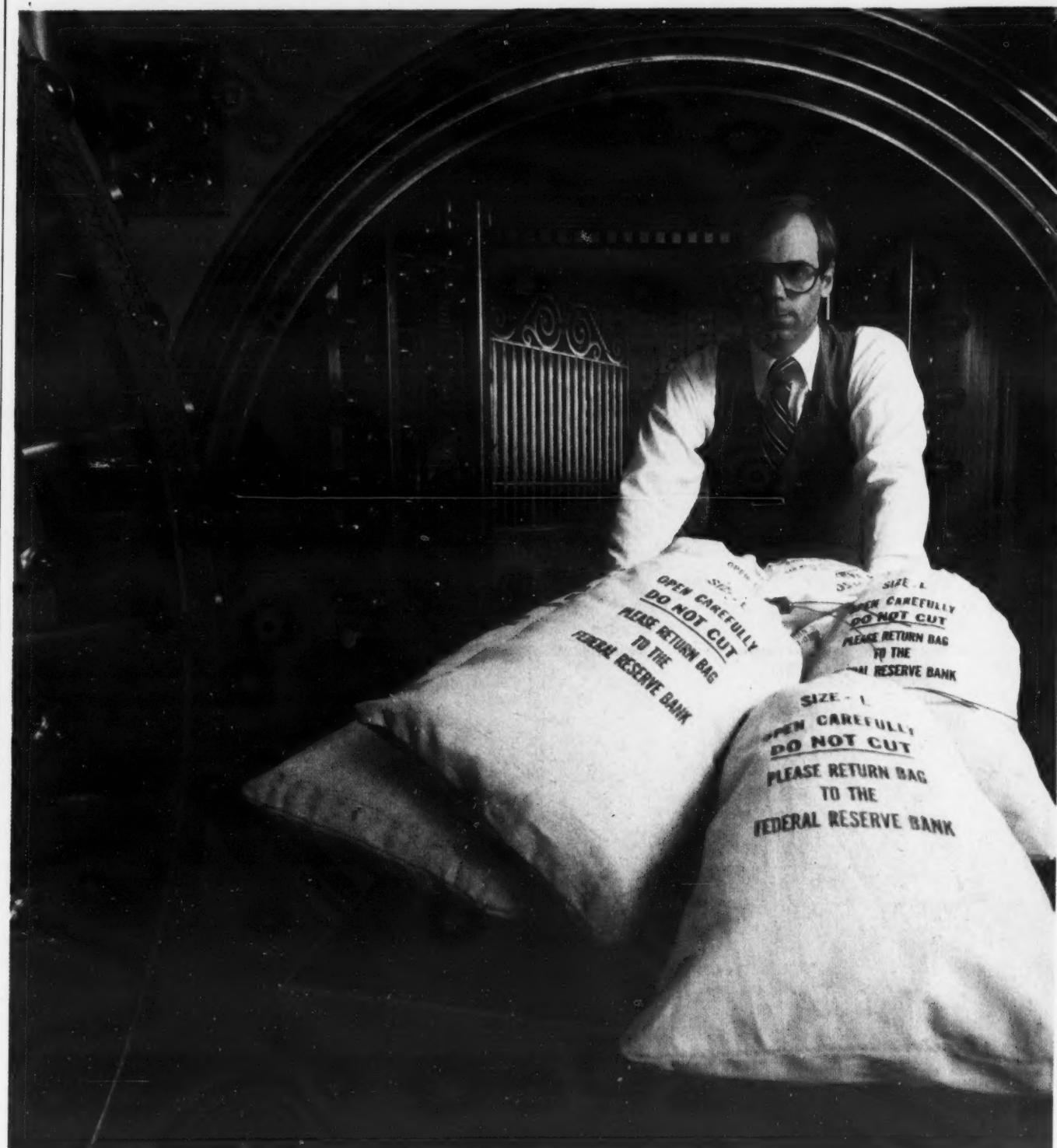
Legal Research Services Accessible From One Terminal

GERMANTOWN, Md. — Under a joint marketing agreement, Westlaw Publishing Co. and Aspen Systems Corp. are making the Westlaw computerized legal research system and the Aspen litigation support services available through a single terminal.

The Westlaw system allows instant research on a CRT terminal of all reported opinions of the U.S. Supreme Court from 1932, the opinions of the federal courts from 1961 and reported opinions of all state courts from 1978.

While Westlaw is a generalized research data base available to all subscribing users, the Aspen product is a data base built for a specific law firm or corporation involved in litigation. An Aspen data base costs at least \$100,000, according to Lewis H. Vovakis, vice-president of commercial and legal services at Aspen.

Aspen is providing the technical interface to allow customers to connect between the Westlaw data base and the Aspenet time-sharing network.



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Wang Granted Loan

BOSTON — A \$5 million, 10-year loan to Wang Laboratories, Inc. for continued expansion which should support nearly 400 more jobs in Massachusetts was announced recently by Gov. Michael S. Dukakis, Daniel J. Holland, president of the Massachusetts Capital Resource Co. (MCRC), and Dr. An Wang, chairman of the board and president of Wang.

Wang's annual sales are estimated to be in the \$195 million to \$198 million range for fiscal 1978, with the company recently entering the rolls of the Fortune 1000 for the first time last month with a listing of 873rd.

The loan was made by the MCRC, formed under Massachusetts legislation last year.

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HIS Beefing Up Mini Image

(Continued from Page 49)

In 1975, HIS recognized that minis were the fastest growing sector of the computer industry and turned its attention in that direction. While not knowing exactly what they wanted in a new mini system, Honeywell executives knew "the company had to be there."

HIS decided to build a machine that can "be turned into anything you want. Compatibility is the key. Any of our Level 6 minis starting with the Model 33 can be upgraded in the field.

"A user can start with a Model 33 for about \$25,000 and grow into our most sophisticated mini product selling for \$250,000, but pays for the upgrade only as needed," Pompa declared.

This is done simply by plugging in additional computer module boards. All of the memory, I/O controls and devices can remain in place, Pompa said.

Another Problem

Another part of the image problem stems from the perception that HIS is not a high-technology company, Pompa complained. "But, we spend the highest amount on R&D after IBM," he claimed.

Aside from heavy R&D spending on the mini line, Pompa noted other features the marketing staff was stressing that will help assure HIS a niche in the mini market.

The line is open-ended and will be added to on both ends. In addition, a user can increase DP capability by two to three orders of magnitude with Level 6 because of the compatibility of the entire line, Pompa suggested. Modular software development is another feature that makes the Level 6 attractive to users.

In commenting on how competitors might view the uniqueness of these selling points, Pompa stated he didn't think the competition could deliver a product with the versatility of the Level 6 series.

HIS is also making a major foray into the international marketplace. Currently about 40% of revenues for the Level 6 come from foreign markets. The computer industry is worldwide, Pompa said, and to achieve favorable earnings a company has to have worldwide volume. Pompa is aiming for 50% foreign revenue for the Level 6, noting that full Level 6 production recently started in France.

Sales of the Level 6 line are rocketing, Pompa reported. For the first half of fiscal 1978, HIS's total bookings were up 485% from 1977, with a major portion of the revenue growth accounted for by Level 6.

When asked if the growth in

minicomputers would negatively affect the growth of the large system sector of HIS's business, Pompa said it would not, adding that the minicomputer line would have a synergistic effect on HIS's overall growth.

To accommodate increased

sales growth, Pompa said the Small/Medium division has been hiring a salesman a week for the past several months.

"We are still a small factor in a very big business," Pompa said, "but we are winning contracts away from major mini makers."

Swedish Companies Plan Appearance at Wescon

LOS ANGELES — Several Swedish electronics companies will be making their first appearance in the U.S. market at Wescon/78 which will be held here Sept. 12-14.

Stig A. Cedermark, Swedish trade commissioner, said that most of the 11 companies exhibiting are actively seeking U.S. distributors and sales representatives.

The Swedish exhibit, the first ever jointly coordinated, will occupy booths 509 and

511-522 on the Wescon exhibit floor at the Los Angeles Convention Center.

Exhibiting Firms

Exhibiting Swedish companies will be Swedish Sunrise, AB, LM Ericsson Telematerial AB, Rifa AB, Aros Electronics AB, AB ATEW, Bino Elprodukter AB, Data-Mec AB, Satt Elektronik AB, Patscentre Scandanavia AB, Transduktor Winding AB and GME-System AB.

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So more people can get more out of the system at the same time, we speeded up our operating system. With the help of our latest Multiprogramming Executive, MPE III, people at dozens of terminals can simultaneously enter and update the data base, develop programs or solve problems. And they can use any of six languages, too.

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MPE III also gives you some features previously found only on expensive mainframes. Multi-point terminal support is one. You can cut your communications costs substantially by hooking up a string of terminals on a single cable, with a 9600 baud line speed.

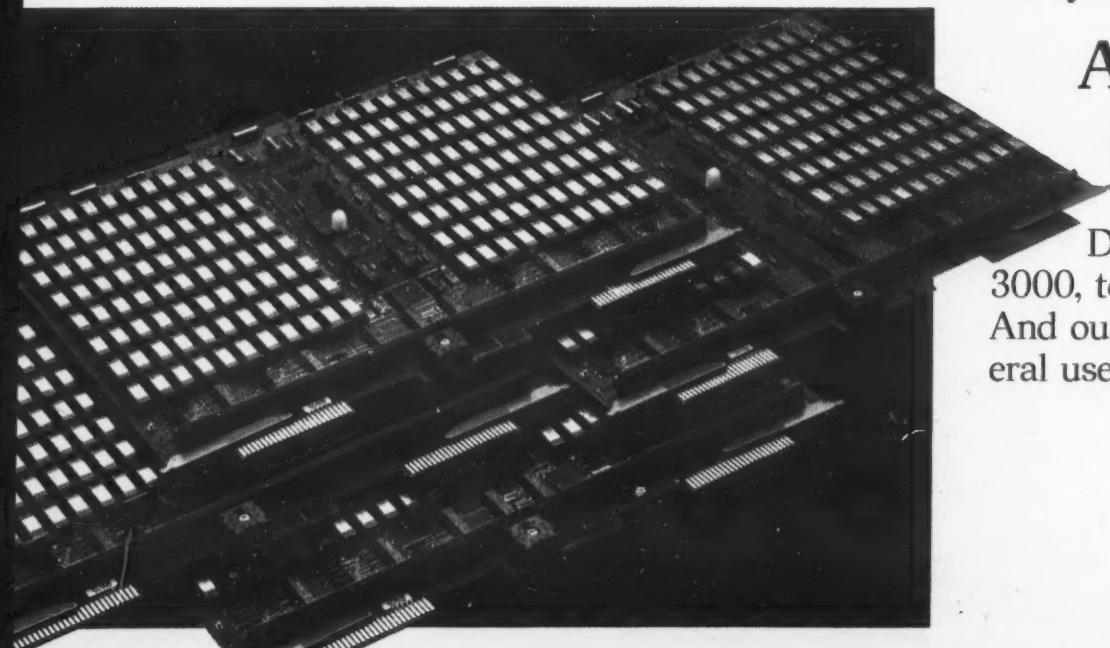


Private volume disc files is another asset. A set of commands allows you to interchange disc volumes without powering down and reconfiguring the system.

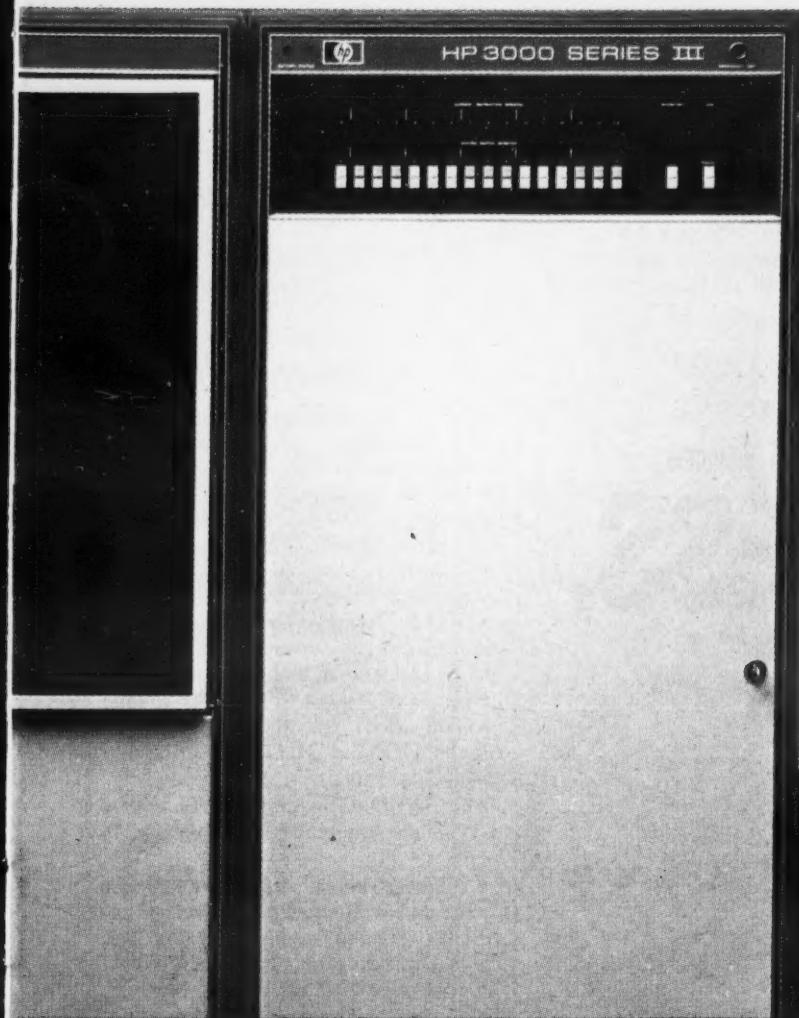


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While we're making it easier to use the HP 3000, we still want to give you all the personal help we can. So we've added a number of consultants in on-line transaction processing and manufacturing to our field force.

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With all these advantages, and system prices starting at

\$115,000, don't you owe yourself a closer look? Call your nearest HP office listed in the White Pages and ask about a hands-on demonstration of the powerful Series III, the new head of HP's business systems family. Or write to Hewlett-Packard, Attn: Bill Krause, Dept. 329, 11000 Wolfe Road, Cupertino CA 95014.

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Brandon Gives Chevron First Royalty for Cids

SAN FRANCISCO — Brandon Applied Systems, Inc. has paid Chevron Chemical Co. \$40,000, the first in a series of royalties for Chevron's Comprehensive Distribution System, known as Cids.

Marketed through Brandon's Rand Information Systems Division, Cids has enabled Rand to expand operations worldwide. Rand now has offices in London and Paris and in Sydney and Melbourne, Australia.

The development of Cids was started in 1969 at Chevron. By 1971, Chevron had designed and installed systems using CRT terminals and a central computer at San Francisco to transmit order information from Chevron's regional sales offices to shipping locations. Chevron now has a telecommu-

nications network with 54 terminals connecting 31 cities.

The system maintains on-line inventories of all Chevron products at all shipping locations and makes inventory and order status information continuously available.

Realizing the versatility of the system, Chevron entered into a marketing agreement with Rand in 1973, with Chevron providing marketing support in the form of demonstrations of the system to prospective buyers. So far, Chevron said, it has shown the system to more than 100 buyers.

Chevron is anticipating at least nine more royalty checks from Rand sales — all to multinational businesses currently testing or awaiting installation

of Cids.

"This unique translocation process enables Rand to build fully customized real-time systems using our proprietary software tools from operational systems like Chevron's. We don't reinvent the wheel each time a system is

developed," according to Dale Darnley, vice-president of Rand.

"In order to minimize the high cost of system development," Darnley stated, "most future systems will be developed using the Chevron and Rand approach."

Executive Corner

- Richard J. Matlack has been elected vice-president of Dataquest, Inc.
- Richard W. Clikeman has been promoted to executive vice-president for Execucom Systems Corp.
- Peter A. Bornstein has joined Boole and Babbage, Inc. as director of prod-

uct management.

- Peter Kozochok has been named vice-president of scanning systems sales at National Computer Systems, Inc.

- Thomas Murawski has been appointed director of engineering at ITT Domestic Transmission Systems, Inc.

- John H. Dick has been appointed project manager of advanced products for A.B. Dick Co.

- Lois B. Hilimire has been appointed chief operating officer of Chase Econometrics Associates, Inc.

- George R. Wood has been named corporate product director at Cramer Electronics.

- Peter B. Pitsker has joined North & Donahoe as an associate.

- John P. Glynn has been elected vice-president of finance and chief financial officer of General Instrument Corp.

- James A. MacInnis has been named vice-president of the National Accounts Division at Data Technology Industries, Inc.

- Robert D. Chisum has been elected a vice-president of the Micropolis Corp.

- Marcel Perras has been elected chairman of the board of governors of Intelsat. The 27-member board also elected Randolph H. Payne of Australia as its vice-chairman.

- Thomas J. Beadoin has been named vice-president of Solar Services, Inc. The firm also named Herbert D. Toback a senior operations officer.

- Nachum H. Bernard has been appointed vice-president of the Computer Division at Geisco Technology Corp. Robert Thomason was appointed staff assistant to the president.

- W. Robert Fagley has been appointed director of marketing for National Semiconductor Corp.'s Computer Systems. The firm also named Roy J. Brant corporate vice-president of human relations. Harry H. Wetzel, president and chief executive officer of The Garrett Corp., joined National Semi's board of directors.

- Clinton DeGabrielle has joined General Automation, Inc. as senior vice-president and chief marketing officer.

- Mike Kirby has been named vice-president of marketing for Microcomputer Systems Corp. Charles T. Leis joined the firm as Series/1 program manager.

- Kenneth Gerstner has been appointed controller at Trendata, where he will be responsible for all accounting functions for the Memory Products Group and the Terminal Products Group. Carl Peterson was appointed marketing and planning specialist.

- Martha Lawlor has been promoted to the vice-presidency of the Education Services Division at Deltak, Inc.

- Hal Pray has been appointed manager of small business systems marketing at Data General Corp.

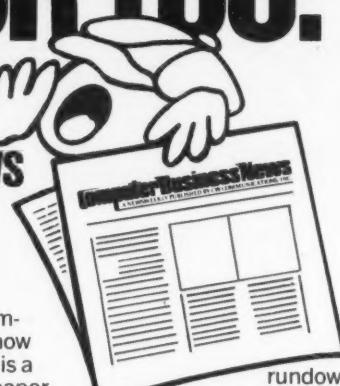
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Computer Business News will be edited to serve key executives in management, engineering, production and marketing at original equipment manufacturers, systems houses, distributors, representatives, large end users and other multiple unit buyers of computer products and services. According to International Data Corporation, the world's leading EDP market research firm, this marketplace is over \$4 billion now, and should grow rapidly to \$9 billion in 1981! So the need for good, up-to-date information is especially important.

Computer Business News will provide that information. As a newspaper, it will have late deadlines. And as a paid-circulation publication, it's entitled to fast delivery—every week. The newspaper format allows it to cover hundreds of items in each issue—the latest product announcements; weekly



rundowns of changes in management and company acquisitions; national and industry economic trends—even international industry news. For all of these reasons, subscribers will pay to receive **Computer Business News**, rather than rely on free alternatives.

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Systems Architect

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We're looking for consultants who can help clients throughout the world apply structured analysis/design/programming on state-of-the-art EDP projects. And we're looking for instructors who can conduct intensive seminars on structured techniques throughout the USA, Canada, South America, Europe and Australia.

Heavy travelling is involved — you're likely to be on the road two weeks a month. And when you're in the office, you'll be hard at work keeping up with the technical literature, writing Your ideas for publication in technical journals and textbooks, and working with other members of the YOURDON staff to develop new concepts and techniques in this exciting new field.

Why would anyone want such a demanding job? Well, if you've been trying to get people to use structured programming in your company and they just ignore you — you should be with the people who pioneered the concepts in the first place. If you're convinced that you've got important new ideas on the right way to develop software, and your boss rewarded you by transferring you to the maintenance department — you should have joined us six months ago!

Interested? Send your resume to:

Mr. Geoffrey Frazier

YOURDON Inc.

1133 Avenue of the Americas

New York, New York 10036

SYSTEMS ANALYST/ PROGRAMMER

Openings in our Management Information and Services department offer excellent opportunity for an individual with growth potential. We are looking for individuals with a college degree and two to four years experience. Our equipment is IBM 370-145 and IBM 370-148 running DOS/VSI and OS/VSI. A working ability with this equipment is highly desirable.

Nekoosa Papers Inc., a leading manufacturer of business and communications papers, is located in an attractive Central Wisconsin community with excellent schools and outdoor recreation opportunities.

Please send resume including salary requirements to:

Mark D. Sprague

Personnel Services Administrator

Nekoosa Papers Inc.

A Company of Great Northern Nekoosa Corporation

100 Wisconsin River Drive

Port Edwards, Wisconsin 54469

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PROGRAMMERS AND SYSTEMS ANALYSTS

Put Your Experience To Work For You In Building A Better Career Opportunity

Sperry Univac has a variety of challenging opportunities waiting for you at one of our Minneapolis locations. These openings exist within our Airline Industry Development Center which designs and supports software applications such as reservations, ticketing, cargo, departure control, message switching, check-in, hotel and fare quote. We are searching for candidates with 2+ years experience in ANY of the following disciplines:

- Design, implementation and support of real time applications
- Acceptance testing of application programs,
- Technical support in the customer environment
- Specific support of OS 1100/TIP/CMS

In addition to requiring experience within the areas mentioned above, it is also desirable to have a background in FORTRAN, and/or general UNIVAC 1100 series exposure.

We offer highly competitive starting salary, a comprehensive benefits program and outstanding professional and personal growth opportunities.

FOR IMMEDIATE ATTENTION,
PLEASE CALL COLLECT OR
DIRECT YOUR RESUME TO:
P.Y. Peterson

SPERRY UNIVAC

Univac Park
P.O. Box 3525, M.S. U1F28
St. Paul, Minnesota 55165
(612) 456-2309

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We have two big pairs to fill.

If you've outgrown the limits of a comparable position — man or woman — step right into something your size. Far-reaching expansion of two client companies creates these unusual and immediate opportunities, each with substantial bonuses, stock options, and plenty of room to stretch.

DEVELOPMENT DIRECTOR: Combined Internat'l. Network & Operating System

Dominant, independent corporation offers equal challenge and reward to an innovative project planner with both conceptual and administrative strength. To lead a high level, 18-24 member technical staff in developing a worldwide network, (largely DEC), of data centers, and interactive as well as remote batch application computers, based on a state-of-the-art mainframe operating system.

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Keen, perceptive mover and shaker to establish long-range goals and activate top management to achieve them. Mushrooming complex of high-tech component and systems manufacturer requires strong similar experience. Now using Burroughs to 3-shift capacity. 370/138 by January. Projected as host computer with CICS and DL/1.



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We will also be here Monday and Thursday to 8 p.m. for your confidential inquiry.

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Conn. corp. moving into on-line Data Base oriented systems. Exp. in CICS & broad bkgd. in IBM systems required. Excellent opprt. to develop own staff. Starting salary to \$28,000. Contact Stan Durbas. (fee paid).

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Hartford, Conn. 06103
(203) 278-7170

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New York, Philadelphia,
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Leading data communications company seeks an aggressive, dynamic sales professional who explores new prospects continually while maintaining existing accounts.

Minimum 3 years successful sales experience in one of the following areas is essential:

Terminals, modems, mini-systems, time-sharing.

We offer a highly competitive base salary, superior company benefits, and expenses.

Please send resume including salary history and requirements to:

CW Box 1674
797 Washington St.
Newton, MA 02160

Engineering Programmer/Analyst



Programmer/Analyst needed to develop, document, and maintain FORTRAN and PL/1 systems for structural analysis, structural detailing and drafting. Will supervise three assistant programmer/analysts. Position requires systems analysis or computer science degree with technical degree (engineering, architecture, physics) and 2-3 years experience IBM hardware, MVS operating system, IMS Data Base/Data communications software, on-line PL/1 programming, plotting software. Will consider comparable education and experience.

Armco Inc. is a diversified, multi-national company with \$4 billion annual sales. Armco offers you an excellent salary and comprehensive benefits. Your job at our home office in Middletown, Ohio, provides the best of small town or country living with two large metropolitan areas a short drive away.

Please send inquiries to R.W. Schroeder, Armco, Inc., Metal Products Division, 1001 Grove St., Middletown, Ohio 45042.

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USER TRAINING AND COMMUNICATIONS COORDINATOR

University of Wisconsin-Madison, Academic Computing Center. Duties: Coordinate the planning, development, promotion, presentation and evaluation of short courses and workshops for users; supervise newsletter production and other user communication activities. Excellent opportunity for innovative individual to apply training methods and technology to effectively teach people to use the facilities of a major computing center with a UNIVAC 1100 system. Requires minimum Bachelor's degree with two years teaching and one year programming and computing experience. Aptitude and interest in coordinating material and personnel resources to achieve training and communications objectives are essential. Excellent benefits: Comprehensive health insurance program, life insurance, 22 days vacation/year, \$16-20,000 annual. Send resume to: David E. Musolf, 2110 W. Dayton St., Madison, WI 53706 by September 22, 1978.

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ONE OF THE REASONS HE GOT TO BE A FOREMAN AT HIS FULL-TIME JOB IS BECAUSE HE LEARNED TO BE A LEADER AT HIS PART-TIME JOB.

Leadership training is a very important part of the Guard and Reserve programs. Because it takes leaders on many different levels to keep the military operating effectively. The leadership abilities learned and practiced in Guard and Reserve units have many business applications. Because if a person can lead a group of Airmen part-time, he is equipped to assume a leadership role in business.

A lot of what Guard and Reservists learn can be put to good use in the business world. And that includes the many varied skills being taught in Guard and Reserve units. Those are

just some of the reasons employers and supervisors should support the Guard and Reserve and urge their employees to join local units.

Those local Guard and Reserve units, from coast to coast, make up nearly 30% of our defense force at a cost of only a small fraction of the defense budget. Still another good reason for lending your support to the Employer Support of the Guard and Reserve program. Most employers are already behind us. Won't you join them? For details, write Employer Support, Arlington, VA 22209.



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... take advantage of the most individualized job search available in the D.P. industry today. You pay absolutely NO fee for our service. We search out the best opportunities nationwide to fit your earnings & growth potential with respect to your location requirements. In confidence, send us your resume with present salary & geographic preference. Let us maximize your opportunities.

SEARCH E.D.P., INC. 3152 Linwood Ave. Cinci. Oh. 45208

MINICOMPUTER ANALYST/PROGRAMMER Colorado Springs, Colorado

Kaman Sciences Corporation has an immediate need for two experienced minicomputer software people to participate in the development of real-time data acquisition and telecommunications systems. Degree in Computer Science or related discipline, capability in FORTRAN and assembly language programming, and proven experience with minicomputers required. Experience in one or more of the following areas would be a plus: PDP-11, RSX-11, Real-Time Data Acquisition, Telecommunications, Microprocessors.

Please send resume to: KAMAN SCIENCES CORPORATION, Attn: RS, P.O. Box 7463, Colorado Springs, Colorado 80933.



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Performance Measurement Specialist

Our corporate facilities management group has an immediate opening offering excellent potential for career growth.

This position involves the measurement and evaluation of overall hardware and software systems performance, capacity planning, and the formulation of recommendations related to hardware and software upgrades.

The person we seek should have 3-5 years experience with hardware/software performance measurement, MVS internals, and hardware configuration planning. MS in Computer Science, or equivalent preferred. Starting salary in mid-twenties. Send complete resume to:

EMPLOYMENT MANAGER W1-1E

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**UNIVERSITY OF
PETROLEUM AND MINERALS
DAHHRAN, SAUDI ARABIA**

The Department of Systems Engineering, University of Petroleum and Minerals, Dhahran, Saudi Arabia, will have faculty positions open for the Academic Year 1979-80, starting 1 September 1979. Candidates with PhD degrees in Systems Engineering with emphasis on large scale systems, automation, computer science and digital systems, preferably with teaching experience are invited to submit their applications.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Air conditioned and furnished housing provided. Free air transportation to and from Dhahran each two-year tour. Attractive educational assistance grants for school-age dependent children. All earned income without Saudi taxes. Ten months duty each year with two months vacation paid and possibility of participation in University's ongoing Summer Program with good additional compensation.

Apply with complete resume on academic and professional background, list of references, publications and research details, and with copies of transcripts, degrees/testimonials, including personal data, such as home and office addresses, telephone numbers, family status (spouse's name, names or children, ages and sexes) to:

Univ. of Petroleum and Minerals
c/o Saudi Arabian Ed. Mission
2223 W. Loop S., Suite 400
Houston, TX 77027

**PROGRAMMER/
ANALYST
DATA PROCESSING**

An immediate opening exists for a Programmer/Analyst with a minimum of 1-2 years SVS/3, RPGII experience. Manufacturing experience desired. Excellent salary and fringe benefits. Send resume in confidence to:

J. R. Jones
Division Manager
Employee Relations
Boise Cascade Corp.
P.O. Box 514
Berryville, Va. 22611
An Equal Opportunity Employer

PROGRAMMER

Expanding NCR Criterion installation needs a programmer with min. 5 yrs. COBOL, DOS/OS, online & T/P. experience in transportation, inventory & general acctg. Send resume to Personnel Dept.

Dart Warehouse Corp.
1430 S. Eastman Ave.
Los Angeles, CA 90023

**COBOL
PROGRAMMER**

Baton Rouge, La., Newspaper requires programmer with a minimum of 3 years experience. Degree required. Data base, structured programming and NCR experience a plus. Will be working on latest technology equipment developing structured COBOL '74 on-line applications using on-line program development. Please submit complete resume, including work history and earnings record to: Personnel Manager, State-Times & Morning Advocate, P.O. Box 588, 525 Lafayette St., Baton Rouge, La. 70821.
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Systems Analysts:

If you aren't afraid of responsibility,

**We'll make
a place for you.**

The special demands of our Software Systems Design efforts require special people: computer professionals with an abundance of talent who thrive on maximum responsibility. If you're capable of calling the shots, here's your best chance to call an important one of your own. If you have the skills and perceptions we seek, we'll tailor your position to the area of involvement within our endeavors that suits you best.

Software Systems Design is involved in long term state-of-the-art development for our highly successful Level 6 minicomputer system. In addition to designing system level software, this elite group of computer professionals provides consulting support to software development and guides product evolution. Other involvements include international standards activities and presenting to customers concepts for advanced software systems.

The high visibility and growth potential of these positions cannot be stressed enough. If you're a senior systems analyst with 4 or more years experience, and can assume full project and design responsibility at state-of-art levels, there's a position awaiting your definition in one of the following areas:

Distributed Processing

We need top people to evolve structured network architecture and to design congruent products that can fully exploit that architecture. This work impacts computer networks worldwide in such areas as security, network control, network adaptability, application mobility, endpoint independence, and multiprocess symbiosis. Our further success in this area depends on high-level input from the computer professionals who join our efforts.

Advanced Executive Systems Design

Executive system capabilities are critical to the modularity and flexibility of the Level 6 hardware family — and finely honed professionals are critical to the development of those capabilities. Some of your responsibilities will include special purpose real-time and OEM systems, business and transaction processing systems, and special challenges in modularity and applications mobility across executive environments. You can also anticipate future involvement in the design of a totally new high-end executive.

End User Products

As the importance of end-user facilities continues to increase, we need individuals with backgrounds in such industry-oriented products as data-entry, transaction processing, and office automation. If you have such a background, you will be responsible for designing Level 6 products with consistent user visibility. This is the ideal environment for individuals sensitive to user needs and perspectives.

For a position that offers maximum responsibility and maximum individual definition, please forward your resume, including area of interest and salary history, to: Ms. B. Hurt, HONEYWELL S/MISD, BM-002, 300 Concord Road, Billerica, MA 01821.

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Classified
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**SITUATION
WANTED**

Medium size corporation located in N.Y.C. is actively seeking additional capacity on a 370/145-148 DOS/VS (1) Megabyte machine located in the N.Y.C. area. The agreement would be for CPU only; we would supply our own peripherals unless sharing of same is more advantageous. Staff requirements for operations & S&P would be met by our corporation. Some typical requirements for our operations would be CICS up 10-12 hours a day (2) batch partitions would be needed 8-12 hours (not necessarily prime shift) depending on throughput. Corporation is willing to make a 2-4 year commitment based on dollars.

CW Box 1668
797 Washington St.
Newton, MA 02160

PROGRAMMER/ANALYST

Challenging positions available for results oriented individuals on various levels with this attorney related company. Our direction is to provide a variety of computer services for attorneys and we are seeking qualified persons to fill key positions relative to the development of those services. If you have a good background in systems design and a good working knowledge of IBM 360/370 Assembler Language or ANS Cobol, we are interested in hearing from you. Should you have a financial background and/or CICS/VS experience, that would definitely be a plus.

Law firm management, loan closing/document preparation, probate/trust accounting . . . are just a few of the systems being developed by this progressive organization.

The location is in sunny Florida and the data processing environment is a DOS/VS Operating System using CICS/VS on an IT/EL A/S 5-3 (3 Meg). In addition to group insurance we offer a profit sharing and retirement program.

Contact: Kermit E. McKinney
Manager, Data Processing

Lawyers' Title Services, Inc.

P.O. Box 3588
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(305) 425-1646

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Programmer/Analysts

We offer a unique opportunity to highly skilled programmer/analysts who are anxious to be part of a rapidly growing corporation and data processing department. There are currently four openings for programmer/analysts (a dual position involving both systems design and actual programming) with direct growth potential into management.

Background should include sound academic credentials with a four year degree (in any field) strongly preferred, and at least a year of experience with proficiency in COBOL. Salary for these positions is wide open.

We are located in an attractive eastern suburb of Cleveland with easy access to interstates in all directions.

Even if you are not actively in the job market, we feel this opportunity is worth exploring. Please send resume in strictest confidence to:

Mr. Bruce Ferguson
Assistant Vice President, Data Processing

PROGRESSIVE COMPANIES

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U.S. BUREAU OF THE CENSUS

Systems Programmers
and
Systems Analysts
\$12,336 to \$28,444

The U.S. Census Bureau, located in the Maryland Suburbs of Washington, D.C., has immediate openings for systems programmers and systems analysts.

Applicants should have extensive experience in Data Base Management Systems, and in either COBOL or FORTRAN. Preference will be given to candidates having experience with UNIVAC's Data Base Management System, DMS-1100 on the EXEC-8 Operating System.

These positions are in the Career Civil Service. Level of pay will vary from grades GS-7 to GS-12 depending upon education and experience.

Send your resume or SF-171 to: U.S. Bureau of the Census, Personnel Division, Rm. 3227B-3, Washington, D.C. 20233 Attn: M. Lam

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RPG II - 2 Yrs Exp.
for Expanding Dept.

Growing International firm with over 75 offices across the U.S. & Canada invites ambitious Programmer with solid background in RPG II to join midtown Manhattan expanding Computer Services Department. Will be entering Distributive and Teleprocessing areas in the near future. Desire to learn these specialties & successfully apply them mandatory.

Salary commensurate with experience. Comprehensive fringe benefits package offered. Our employees know of this ad. Send resume in confidence to: CW Box 1667, 797 Washington St., Newton, Ma. 02160

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Fox-Morris Associates, nationally recognized as leaders in Data Processing placement, has current reqmts w/Fortune 500 clients, including:

EDP Equip.	\$40,000
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Sr Sales Engineer	
Mini Computers	\$35,000+
Sr Sales Rep	
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Client cos pay all emp expenses. For additional info contact, in confidence, Don Owens, (215) 561-6300. FOX-MORRIS PERSONNEL CONSULTANTS, 1500 Chestnut St., Phila, PA 19102.

EDP SPECIALISTS

Nationwide

Finan Sys Mgr	To \$37K
Mfg Sys Mgr	To \$37K
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Mfg Sys Mgr	To \$28K
Westchester, NY location	

Fees assumed by client co's
LESLIE, KAVANAGH
505 5th Av, NY, NY 10017
(212) 661-0670 (agency)

PROGRAMMER SYSTEM 3 - 15B

- International auto parts distributor needs programmer with minimum 2 years RPG-II experience System 3 Model 10 or 15.
- Opportunity to learn CCP, gain cardless experience.
- Growth pattern includes distributed data processing and on line applications.
- Growth possibility to develop into management.
- Excellent company paid benefits.

Send resume to:

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P.O. Box 317
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SYSTEMS COORDINATOR

COMMUNICATIONS AND
DATA BASE SOFTWARE
CENTRAL FLORIDA

REGIONAL DATA CENTER
Responsible for managing the Telecommunications and related Systems Software team to develop, modify, and maintain complex software systems in a large IBM 370/165-II environment. Currently OS/MVT/HASP, CICS, TSO moving to MVS. Center is node in State University network. Prefer M.S. in computer science and in-depth technical knowledge of MVS, CICS/VS, and TSO. Salary high teens. APPLICATION DEADLINE September 22, 1978. Affirmative Action Equal Opportunity Employer. Resume to: Director, Central Florida Regional Data Center, UNIVERSITY OF SOUTH FLORIDA Tampa, Florida 33620

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Find out what NCR's
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You'll be working with leading professionals who have placed some of the world's most advanced hardware and software on the market. You'll be responsible for researching, organizing, writing and maintaining technical publications which document the many new products now being released.

The ideal candidate will have a background that encompasses most of the following:

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- Operating systems design or applications design or programming of financial, retail or manufacturing systems.

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If you join us, you'll not only be working with advanced state-of-the-art systems, but you'll enjoy the rewards of competitive earnings, a comprehensive benefits program, and an excellent relocation package.

Don't wait, forward your resume including salary history to our Corporate Headquarters, Manager of Educational Publications, Dept. B50, NCR Corporation, 101 West Schantz, Dayton, Ohio 45479.



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UNIVERSITY OF PETROLEUM AND MINERALS

DHAHRAN, SAUDI ARABIA

The University of Petroleum and Minerals, Dhahran, Saudi Arabia, will have Professional positions (all ranks), open for the Academic Year 1979-1980, starting 1 September 1979 in Business and Industrial Administration (Undergraduate and MBA) including the following fields:

Economics, Marketing, Accounting, Management, Operations Management, Operations Research, Organizational Behavior, Finance, Personnel, International Business, and Information Systems.

PhD degree and teaching experience preferred. Minimum regular contract for two years, renewable. Competitive salaries and allowances, air conditioned and furnished housing provided. Free air transportation to and from Dhahran each two-year tour. Attractive educational assistance grants for school-age dependent children. All earned income without Saudi taxes. Ten months duty each year with two months vacation paid and possibility of participation in University's ongoing Summer Program with good additional compensation.

Apply with complete resume on Academic and Professional background, list of references, a complete list of publications with clear indication of those papers published in refereed professional magazines/journals, research details, and with copies of transcripts/degrees/testimonials, including personal data such as family status (spouse's name, names of children, ages and sexes) home and office addresses, telephone numbers to:

University of Petroleum and Minerals
C/O Saudi Arabian Educational Mission
2223 West Loop South, Suite 400
Houston, Texas 77027

**Programmers
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BICS

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Cedar Rapids, Iowa 52401

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DATA PROCESSING PROFESSIONALS... CAREER OPPORTUNITIES

Blue Cross & Blue Shield of Rhode Island can provide immediate opportunity for talented DP professionals to join a dynamic, technologically talented staff in a quality organization.

Challenging new positions are now available for individuals who qualify as:

- Programmers
- Programmer/Analysts
- Systems Analysts
- Data Base Analysts

Areas for personal growth, in a creative, innovative environment, include:

IBM 370-158 system with major hardware change during 1979
VSI operating system with MVS in mid '79
IMS Data Base/Data Communications
COBOL
GIS

In addition to technological challenge, positions offer excellent salaries and a comprehensive benefits package.

On SATURDAY and SUNDAY, SEPTEMBER 9 and 10, between 9:00 a.m. and 3:00 p.m., we're holding an EMPLOYMENT SEMINAR during which time our S&P staff will be here to provide info, interview and/or hire!

If you have at least one year of experience in COBOL and want to move and grow, send us a resume, call us (collect), anytime...or...come on in and visit us during our EMPLOYMENT SEMINAR on SEPTEMBER 9 and 10.

For any or more information, please contact:

JACK SMITH, Employment Manager
**BLUE CROSS & BLUE SHIELD
OF RHODE ISLAND**
444 WESTMINSTER MALL
PROVIDENCE, RI 02901
Phone: 1-401-272-8500

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WE HAVE THE FOLLOWING
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Communications Programmer significant experience in Communications Control Programming. Requires knowledge of asynchronous and synchronous line protocol with experience on terminals, controllers and RJE. Primary duty will be design and maintenance of teleprocessing systems using Btam and Vtam.

OS Software Systems Programmer

Significant experience in OS or VS operating system modification and maintenance.

Call collect or send resume to:

Fran Keith
P.O. Box 11337-LF
Tucson, Arizona 35734
(602) 294-5211, Ext. 5484

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HUGHES AIRCRAFT COMPANY

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CAREER POTENTIAL
IS SOARING . . .
ALL THE WAY
TO THE STARS.



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PROGRAMMER/ANALYSTS with Word Processing Software Experience
DATA BASE MANAGEMENT SPECIALISTS

OPERATIONS & TEST ANALYSTS

AEROSPACE ENGINEERS with:

Navigation Systems Analysis, Orbital Dynamics, Mission Planning, Flight Mechanics or Guidance & Control

PHYSICISTS & APPLIED MATHEMATICS with:

Software Modeling of Physical Systems, Analysis of Flight Trajectory Data, Consumables Analysis, or Avionics Modeling

COMPUTER SCIENTISTS with:

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QUALITY ASSURANCE for Software Development

SOFTWARE ENGINEERING METHODOLOGIES

DESIGN ENGINEERS with Digital Systems

LARGE SCALE MANAGEMENT INFORMATION SYSTEMS with knowledge of CYBER systems

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BUSINESS APPLICATION PROGRAMMERS with U1100; COBOL, Administrative Management Data Systems (some interactive), Document & Word Processing Systems (on IBM 360/65)

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SYSTEMS & SOFTWARE ENGINEERS with U1100; Hardware & Software Planning/Scheduling, Configuration Management, Problem Analysis

ADAGE GS/340 GRAPHICS SYSTEM with U1100; Develop Applications & Utility Interactive Software, Perform Modifications & Upgrades to System Software

For immediate attention, please call or send your resume in complete confidence to:

Gus Siekierka (713) 486-8153

**COMPUTER
SCIENCES
CORPORATION**

Applied Technology Division
1300 Bay Area Boulevard
Houston, Texas 77058

Major Offices and Facilities
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Southeast D.P. Opportunities

Want out of the cold winters into the sunny Southeast? We have immediate openings with the most progressive clients in the Southeast & nationally for Systems Analysts & Programmers. Salary ranges to \$30K. If interested send resume or call Continental Personnel, Inc., P.O. Box 11321, Charlotte, NC 28209 (704) 525-2160.

Data Processing Systems Engineer

to work in computer software planning; procurement and development for a multi-campus University Computer Center. Minimum requirement is 4 years of work experience in systems software. MVS experience is desirable. Prospect will be employed as a senior staff member of the Planning and Development group. Hardware includes an 8 megabyte 370/168. Software includes VTAM/NCP, CICS/VS, IMS/VS, MODEL 204, TSO/WYLBUR and JES2. Advanced training will be provided. Position carries 5 weeks vacation per year. Salary open.

Starting date is Oct. 21, 1978. Closing date for receipt of resumes is Sept. 20, 1978. Send resumes to:

Assistant Director for P&D
University of Illinois
Room 370 RRB
P.O. Box 4348
Chicago, Illinois 60680

The University of Illinois is an Equal Opportunity Employer and encourages applications from women and minorities.

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PROGRAMMERS

Two positions for minicomputer programmers with 1 to 4 years experience. Programmers will develop software for automated storage systems using DEC PDP 11/34. Experience in RSX-11M operating system and assembly language preferred. Immediate openings. Salary to \$18,000. Call collect or write Jim Slomski or John Heron, Hartman Engineering, 66 School Street, Victor, New York 14564, 716-924-3075.

INTERNATIONAL OPPORTUNITY

The King Faisal Specialist Hospital and Research Centre

PROGRAMMER ANALYST-IBM SYSTEM 3

An exciting opportunity awaits you at the King Faisal Specialist Hospital and Research Centre if you have the skills, the experience, a spirit of adventure, and the desire to accept the challenge.

This 250-bed specialist, referral center is part of a larger King Faisal Medical City which consists of a large, modern housing complex; a recreation facility which offers swimming pools, tennis courts, squash courts, a softball diamond and other amenities; a multinational work force; and a commitment to the highest quality patient care available.

The Data Processing Department is seeking a qualified Programmer Analyst to develop new programs or revise existing programs in support of customer systems and operational requirements of an IBM System 3, model 12. The minimum requirements which the individual selected will possess are a university degree and four years of experience in data processing, at least two years of which must be programming of systems.

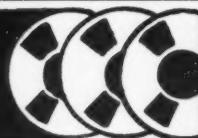
The salary and fringe benefits for this position are excellent. If you are interested and qualified, please send your resume indicating your dates of availability and current salary to:

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International Representative
Hospital Corporation International
One Park Plaza
Nashville, TN 37203

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IRAN



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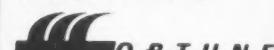
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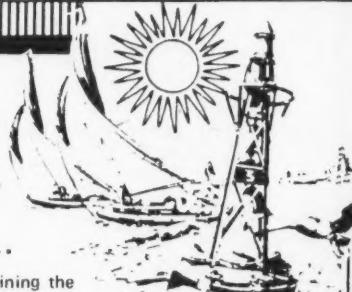
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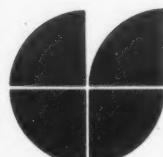
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We offer a significant challenge in a growing Data Processing environment with a unique opportunity to enhance the operations of the entire company. Pontiac is located 100 miles south of Chicago, Illinois.

For consideration, send detailed resume with salary requirements in confidence to:

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Personnel Officer

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bilities are also necessary. You will be an important part of a project team dedicating its efforts to developing manufacturing/business systems in a COBOL data base environment. B.S. preferred.

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To arrange an interview appointment in advance, call collect: TOM WHITE, (714) 759-5256.

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National Semiconductor

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In 1976, for example, 1,218 different companies ran ads in Computerworld to look for computer people. This list of advertisers includes just about every type of organization you can think of—and some you might not. Here's a small sample of 1976 recruitment advertisers in Computerworld and the type of positions they were filling:

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Here's what three recruitment specialists have to say about their advertising in Computerworld

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Richard Kramer
President
Electronic Data Personnel
1000 Grand Avenue
Kansas City, MO 64106

"The demand for computer people is even stronger now than it was back in the 'go-go' days of the '60s, particularly at the individual contributor level. And Computerworld seems to filter through to these people very well—more so, perhaps, than any other publication we've used."

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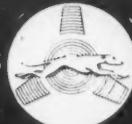
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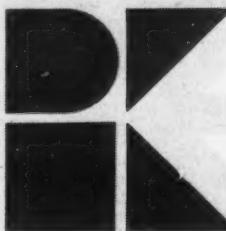
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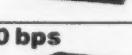
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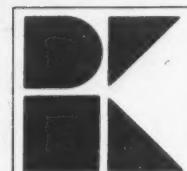
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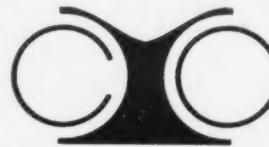
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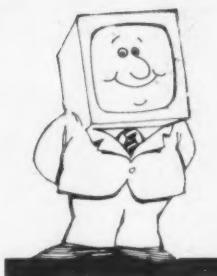
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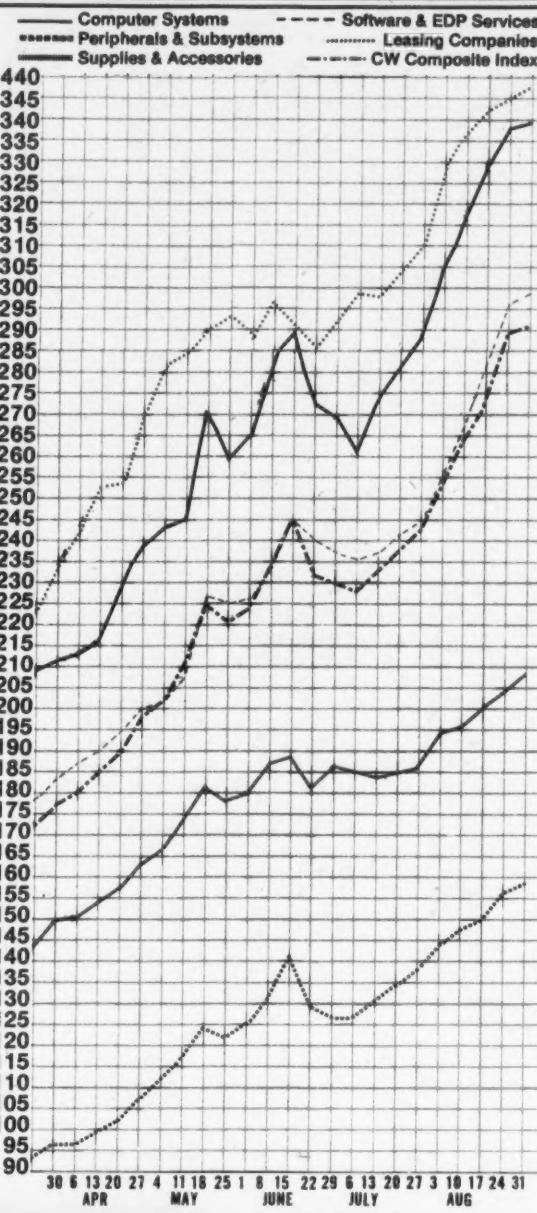
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 1978 1977
 Shr Errnd \$.82 \$.66
 Revenue 874,552,000 822,186,000
 Earnings 54,627,000 44,003,000
 6 Months Shr 1.51 1.17
 Revenue 1,705,252,000 1,564,750,000
 Earnings 100,762,000 78,356,000

AMDAHL

Three Months Ended June 30
 1978 1977
 Shr Errnd \$.66 a\$.38
 Revenue 73,912,000 45,087,000
 Tax Cred ... 5,190,000
 Earnings 11,038,000 11,045,000
 6 Mo Shr 1.23 a1.36
 Revenue 137,861,000 83,094,000
 Tax Cred ... 9,985,000
 Earnings 20,621,000 21,228,000

a-Adjusted for a two-for-one stock split paid in May 1978.

COMPUTER MICROGRAPHICS

Three Months Ended May 31
 1978 1977
 Shr Errnd \$.11 \$.05
 Revenue 3,143,455 1,255,884
 Earnings 136,361 1,255,884
 9 Mo Shr .31 a1.18
 Revenue 8,617,008 3,627,412
 Earnings 363,530 144,192

COMPUTER PRODUCTS

Three Months Ended June 30
 1978 1977
 Shr Errnd \$.13 a\$.12
 Revenue 2,614,077 2,111,595
 Earnings 242,229 199,406
 6 Mo Shr .26 a.21
 Revenue 5,166,800 4,004,864
 Earnings 469,300 359,230

a-Adjusted to reflect 20% stock dividend paid in November 1977.

COMPUTER SCIENCES

13 Weeks Ended June 30
 1978 1977
 Shr Errnd \$.28 \$.21
 Revenue 76,228,000 64,134,000
 Earnings 3,859,000 3,150,000

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All statistics compiled,
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TRADE QUOTES, INC.
Cambridge, Mass. 02139

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 30, 1978

TRADE QUOTES

EXCH	PRICE				EXCH	PRICE				EXCH	PRICE			
	1978 RANGE	CLOSE AUG 30	WEEK NET CHNGE	WEEK PCT CHNGE		1978 RANGE	CLOSE AUG 30	WEEK NET CHNGE	WEEK PCT CHNGE		1978 RANGE	CLOSE AUG 30	WEEK NET CHNGE	WEEK PCT CHNGE
	(1)	1978				(1)	1978				(1)	1978		
COMPUTER SYSTEMS														
A ANDAL CORP	28- 65	65 1/8	+10 1/8	+18.4	O ADVANCED COMP TECH	1- 2	1 3/4	+ 1/2	+40.0	O DATA ACCESS SYSTEMS	3- 8	11 1/2	+1 1/4	+12.1
N BURROUGHS CORP	59- 85	84	+ 3/4	+0.9	O ANACOMP INC	8- 22	14	- 7 1/4	-34.1	O DATA 100	9- 20	19 1/2	+ 3/4	+4.0
C COMPUTER AUTOMATION	23- 44	35 1/2	- 5 1/4	-12.8	A APPLIED DATA RES.	8- 17	15 7/8	- 5/8	-3.7	O DATA PRODCUTS CORP	15- 25	23	- 5/8	-6.5
M CONTROL DATA CORP	23- 42	41	- 1/4	-0.6	O AUTOMATIC DATA PROC	24- 36	31 1/2	- 2 5/8	-7.6	O DATUM INC	2- 5	4 1/2	- 3/4	-14.2
O CRAY RESEARCH INC	21- 67	67	+10 1/2	+18.5	O COLEMAN AMERICAN COS	1- 2	1 3/4	0	0.0	O DECISION DATA COMPUT	2- 5	4 3/4	- 1/8	-2.5
N DATA GENERAL CORP	42- 68	63 3/4	- 3/4	-1.1	O CMPCU-SERV NETWORK	7- 12	7 3/4	- 1/4	-3.1	O DELTA DATA SYSTEMS	1- 1	1 1/2	- 1/8	-20.0
N DATAPoint CORP	34- 71	69 5/8	- 3/8	-0.5	O COMPUTER HORIZONS	1- 8	8 1/2	+ 1/4	+3.0	O OCCUPATION INC	6- 30	29 5/8	+ 7/8	+3.0
N DIGITAL EQUIPMENT	39- 54	49 3/4	- 1 1/8	-2.2	O COMPUTER NETWORK	8- 16	14 1/2	0	0.0	O DATARAN CORP	6- 24	19	+ 1/2	+2.7
N ELECTRONIC ASSOC.	2- 10	10 1/4	+ 1 1/2	+17.1	O COMPUTER SCIENCES	8- 17	16 3/4	0	0.0	O FABRI-TEK	4- 8	7 1/2	0	0.0
A ELECTRONIC ENGINEER.	11- 19	12 5/8	- 1/8	-0.9	O COMPUTER TASK GROUP	1- 4	3 1/4	+ 1/4	+8.3	O GENERAL COMPUTER SYS	1- 3	2 3/8	0	0.0
O FOUR-PHASE SYSTEMS	19- 40	38 3/4	- 3/4	-1.8	O COMPUTER USAGE	2- 4	3 5/8	0	0.0	O HAZELTINE CORP	10- 17	16 1/2	+2 1/4	+15.7
N FOXBORO	28- 40	37 1/2	- 1	-2.5	O CONSHARE	6- 19	18 1/2	- 1/4	-1.3	O HARRIS CORP	40- 71	67 3/4	- 1	-1.4
O GENERAL AUTOMATION	7- 26	25 3/4	+ 3/4	+3.0	O DATA DIMENSIONS INC	4- 9	7 7/8	- 1/4	-3.0	O INFREX INC	6- 10	8 5/8	- 7/8	-9.2
O GRI COMPUTER CORP	1- 2	1 5/8	0	0.0	O DATATAB	1- 2	1 1/4	- 1/8	-9.0	O INFORMATION INTL INC	8- 12	10	- 3/4	-6.9
N HEMELT-PACKARD CO	62- 90	87 1/2	+ 1/2	+0.5	O INSYTE CORP	1- 2	2 1/2	0	0.0	O INTEL CORP	39- 62	55	- 1	-1.7
N HONEYWELL INC	43- 72	68	- 2 3/8	-3.3	O IPS COMPUTER MARKET	2- 3	3 1/4	0	0.0	O LUNDY ELECTRONICS	4- 5	5 7/8	+ 1	+20.5
N IBM	236-298	293	- 4 3/4	-1.5	O KEYDATA CORP	1- 3	2 1/8	+ 1/8	+6.2	O MSI DATA CORP	12- 19	17 1/8	+ 1/2	+3.0
O MANAGEMENT ASSIST	9- 25	25 3/8	+ 2 1/4	+9.7	O LIGGICON	11- 19	18 5/8	- 3/8	-1.9	O MEMOREX	27- 58	55 3/8	- 1 7/8	-3.2
O MICRODATA CORP	10- 22	22 1/2	+ 1/4	+1.1	A MANAGEMENT DATA	1- 1	7/8	0	0.0	N MOHAWK DATA SCI	6- 15	12 5/8	- 1 1/4	-9.0
O MINI-COMPUTER SYST	5- 8	6 1/2	0	0.0	N NATIONAL CSS INC	15- 36	34	- 1 3/4	-4.8	O CMEX	2- 2	2	0	0.0
C MODULAR COMPUTER SYS	7- 17	16	+ 5/8	+4.0	N NATIONAL DATA CORP	7- 13	12 3/4	+ 1	+8.5	O PENRIL CCP	5- 12	9 7/8	- 1/4	-2.4
N NCR	37- 66	62 1/2	- 3 3/8	-5.1	N PLANNING RESEARCH	17- 30	29 3/4	+ 1 3/4	+6.2	N PERTEC CORP	9- 14	13 7/8	+ 1/4	+1.8
N PRIME COMPUTER INC	20- 39	38 1/2	+ 2 5/8	+7.3	O PROGRAMMING & SYS	1- 1	9 7/8	- 1/2	-2.7	O PCITER INSTRUMENT	2- 2	1 3/4	0	0.0
N PERKIN-ELMER	17- 28	25 3/4	- 1 1/2	-5.5	O RAPIDATA INC	3- 7	6 3/4	- 1/2	-6					

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